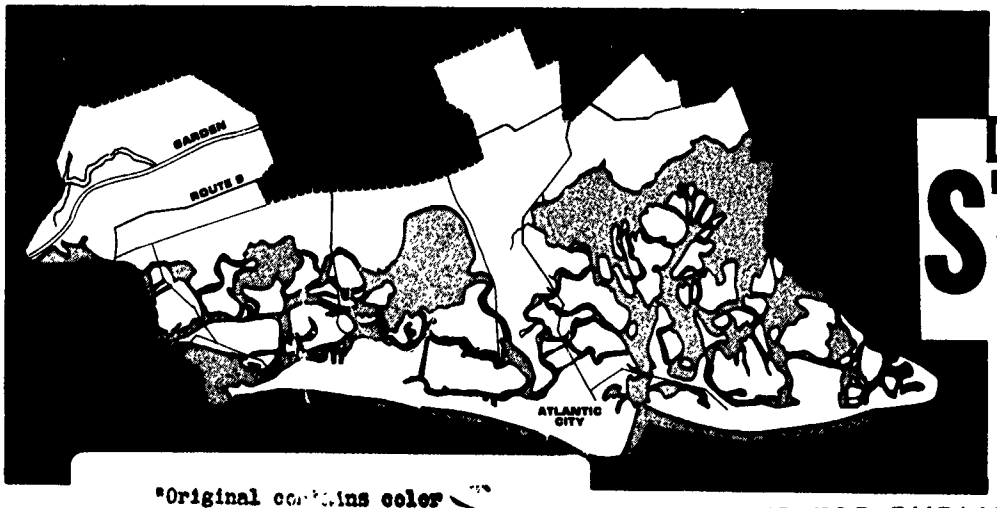
ATLANTIC CITY AREA WETLANDS REVIEW

VOLUME I: OVERVIEW AND CONCLUSIONS



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U.S. ARMY CORPS OF ENGINEERS
PHILADELPHIA DISTRICT, PHILADELPHIA, PA.

REPT NO DAEN/NAP-99999/RACW-81/01

ERRATA SHEET

Please note the following modifications of the study's text and figures. The identification of any additional errors would be appreciated.

VOLUME I: OVERVIEW AND CONCLUSIONS

Page xvii, Line 14	"theis" should be "their"
Page xvii, Line 22	"Areas" should be "Area"
Page xvii, Line 33	"the" should be deleted
Page xvii, Line 37	"The" should be "the"
Page 1, Col. 1, para. 1, Line 1	"The" should appear before "Atlantic"
Page 1, Col. 1, para. 2, Lines 1 & 2	"assist planners, developers, and builders submitting" should be "assist those submitting"
Page 1, Col. 2, para. 1, Line 4	"role" should be "roles"
Page 5, Col. 2, para. 4, Line 7	"commercial or large private projects" should be "commercial, private, or government projects"
Page 11, Col. 2, para. 1, Line 13	"defined above" should be removed.
Page 17, Col. 1	"6.2.2 Atlantic City" should be deleted.
Page 17, Col. 1, para. 1, Line 6	"on" should be "of"
Page 22, Col. 2, para. 1, Line 7	"improve" should be "alter"
Page 23, Col. 2, Line 4	"," should be "."
Page 25, Col. 2, para. 3, Line 2	"corps" should be "Corps"
Page 26, Footnote, Line 2	"inpact" should be "impact"
Page 29, Col. 2, para 5, Line 3	"resting" should be "nesting"
Page 38, Figure 2-6, Line 1	"DEFINITION AND ACTIVITY ACCEPTABILITY" should be deleted
Page 40, para. 1, Line 1	"Typically its" should be "Typically, its"
Page 40, para. 1, Line 2	"moorage" should be "mooring"
Page 41, para. 3, Line 5	"the" should be "a"
Page 42, para. 1, Line 2	"of water" should be "of a water"
Page 44, para. 1, Line 2	"moorage" should be "mooring"
Page 47, para. 1, Line 1	"bouys" should be "buoys"
Page 48, para. 1, Line 1	"struture" should be "structure"
Page 49, NOTE, Line 2	"moorage" and "Moorage" should be "mooring" and "Mooring"
Page 50, Figure 2-8, Statement 17	"eroision" should be "erosion"
Page 62, Col. 2, Line 3	"attachment algae" should be "attachment of algae"
Page 64, Col. 2, para. 1, Line 10	"routes" should be "roads"
Page 64, Col. 2, para. 3, Line 20	"stakes" should be "staked"
Page 65, Col. 1, para. 1, Line 16	"diamond backed" should be "diamondback"
Page 66, Col. 1, Line 11	"moorage" should be "mooring"
Page 69, Col. 2, para. 1, Line 1	"moorage" should be "mooring"
Page 71, Footnote, Line 2	"anerobic" should be "anaerobic"
Page 72, Figure 2-31	"Minimum dredging" should be "Minimal dredging"
Page 73, Col. 2, para. 1, Line 5	"Wetland" should be "Wetlands"

VOLUME II: BACKGROUND INFORMATION

Page vxii, Line 14	"theis" should be "their"
Page xvii, Line 22	"Areas" should be "Area"
Page xvii, Line 33	"the" should be deleted
Page xvii, Line 37	"The" should be "the"
Page 2, Col. 1, para. 2, Line 1	"project" should be "study"
Page 2, Col. 2, para. 1, Line 2	"sandy" should be "study"
Page 8, Col. 2, para. 3, Line 4	"beach" should be "islands"
Page 10, col. 2, para. 1, Line 10	"areas" should be "area's"
Page 10, Col. 2, para. 2, Line 12	"photographs and map interpretation" should be "photographs, map interpretation, and"
Page 12, Col. 1, para. 2, Line 1	"systems" should be deleted
Page 13, Col. 1, para. 2, Line 6	"north" should be "northern"
Page 14, Col. 1, para. 1, Line 1	"currents" should be "current"

Page 14, Col. 2, para. 3, Line 1	a comma should appear after "steep"
Page 14, Col. 2, para. 3, Line 3	"disposition" should be "deposition"
Page 16, Col. 2, para. 1, Lines 8-9	"a number of visible overwash locations, many of which were" should be "one overwash location which was"
Page 26, Col. 1, para. 1, Line 9	A period should appear after life.
Page 28, Col. 1, para. 2, Line 5	A period should follow estuary.
Page 31, Col. 1, para. 1, Line 2	"the" should be "an"
Page 33, Figure 2-4	"Species of Major Ecological Systems" should be "Species of Major Habitat Types"
Page 37, Col. 1, para. 1, Line 7	"sapidu·" should be "sapidus"
Page 37, Col. 1, para. 1, Line 8	"Palasmonetes" should be "Palaemonetes"
Page 39, Figure 2-6	Amphibians are not located typically in salt water areas
Page 39, Col. 2, Line 3	"and windowpane, along with red" should be "windowpane, red"
Page 41, Table 2-3, Col. 2, Line 10	"roasker" should be "croaker"
Page 42, Col. 1, para. 2, Line 1	"varied" should be "varies"
Page 42, Col. 1, para. 4, Line 3	"Fish and Wildlife" should be "Fish, Game, and Wildlife"
Page 44, Table 2-5	"Bafflehead" should be "Buffle̲head":"Marganser" should be "Merganser"
Page 45, Col. 1, para. 1, Line 2	"The State" should be "the list of State"
Page 45, Col. 1, para. 1, Line 4	"List" should be deleted
Page 50, Col. 1, para. 4, Line 6	"Atlantic City" should be "study area"
Page 50, Col. 2, para. 2, Line 1	"Location of" should be deleted
Page 50, Col. 2, para. 2, Line 2	"categorized" should be "located"
Page 59, Figure 3-6	In the legend, waters 3'-6' should be light blue
Page 66, Col. 2, Footnote 1	"the activity" should be "that purpose"
Page 72, Table 4-4	"Sewerage" should be "Sewage"
Page 73, Footnote	"responsing" should be "responding"
Page 77, Question xiiia	"wetlands" should be "wetland"
Page 78, Question xivb	A comma should follow with; "sue" should be "use"
Page 79, Col. 1, para. 1, Line 3	"however, undertake" should be "undertake, however"
Page 79, Col. 1, para. 1, Line 4	"closely-related" should not be hyphenated
Page 82, Col. 1, para. 2, Line 7	"permit review" should be "permit application review"
Page 83, Col. 1, para. 1, Line 4	"aquisition" should be "acquisition"
Page 86, Col. 1, para. 3, Line 2	"and refinement" should be deleted
Page 87, Table 5-1, Col. 3, Item 3	"system" should be "systems"

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This study provides a regional approach to the regulation of activities affecting the wetlands of greater Atlantic City, New Jersey. Information contained in this review describes the federal permit application review procedures, classifies and indentifies the wetlands of the greater Atlantic City area, provides profiles on the physical, biological, land and water use characteristics of the study area and indicates likely action that the Corps of Engineers would take on permit requests in areas under its jurisdiction. A base line study map is provided of the area.

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PHILADELPHIA DISTRICT, PHILADELPHIA, PA.

ATLANTIC CITY AREA WETLANDS REVIEW

Sponsored By:

January, 1981

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The **ATLANTIC CITY AREA WETLANDS REVIEW** is separated into two volumes. Volume I provides the prospective user with information necessary to understand the Federal permit application review process and with guidance on the formulation, planning and design of proposed projects.

Volume II contains the background information that went into the development of various recommendations contained in Volume I.

ATLANTIC CITY AREA WETLANDS REVIEW

TABLE OF CONTENTS

Chapter 2
STUDY CONCLUSIONS

LIST OF FIGURES AND TABLES

TABLE OF CONTENTS

VOLUME II

Chapter 1
PHYSICAL PROFILE

Chapter 2
BIOLOGICAL PROFILE

Chapter 3
LAND AND WATER USE PROFILE

Chapter 4
PUBLIC OPINION SURVEY

Chapter 5
INSTITUTIONAL FRAMEWORK

LIST OF FIGURES AND TABLES

EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

Atlantic City Area Wetlands Review provides a regional approach to the regulation of activities affecting the wetlands of greater Atlantic City. Its preparation was prompted by the casino-induced development of what is regarded as an environmentally sensitive area.

The primary purpose of the **Review** is to assist planners, developers, and builders submitting applications for Corps permits. It also provides valuable information to Federal agencies involved in the review of applications for Corps permits. Further, use of the **Review** should promote consistency between Federal and State of New Jersey permitting processes.

For convenience of use, the **Review** is separated into two volumes. Volume I provides the prospective user with information necessary to understand the Federal permit application review process and with guidance on the formulation, planning and design of proposed projects. Volume II provides the background information that went into the development of various recommendations contained in Volume I. Under separate cover is the ***STUDY AREA BASE MAP***. In addition to identifying areas under Corps jurisdiction within the study area, the map is to be used as part of the Classification System contained in Chapter 2 of Volume I.

Specifically the **Review:**

- Describes the Federal permit application review procedures as well as the role of Federal, State, and local agencies in the permitting process;
- Describes, classifies, and identifies the wetlands of the greater Atlantic City area;
- Indicates, in general terms, the likely action the Corps would take on permit requests in areas under its jurisdiction; and
- Provides profiles on the physical, biological, and land and water use characteristics of the study area.

The District Engineer, Philadelphia District, U.S. Army Corps of Engineers, is the responsible Federal official for administering various Federal laws regulating activities in the waters and wetlands of greater Atlantic City. In addition to the Corps, three other Federal agencies cooperate with the Corps in the review of permit applications. They are the U.S. Fish and Wildlife Service, the National Marine Fisheries Service, and the U.S. Environmental Protection Agency. Within the State of New Jersey, the Department of Environmental Protection is responsible for permitting activities within wetlands. The procedures, policies, and interactions of the

various Federal, State and local agencies are complex and not often understood. The roles and interactions of these agencies are discussed in Volume I, Chapter 1, Section 1.2, Corps Involvement in the Atlantic City Area, and in Volume II, Chapter 5, Institutional Framework. The ***ACTIVITY ACCEPTABILITY PROCESS***, a principal feature of the study (Vol. I, Chapter 2), is structured to assist permit applicants in making a preliminary determination of the general acceptability of proposed projects. Final determination of project acceptability would be made by the District Engineer on a case-by-case basis.

The following points summarize the major aspects of the permit application review process (Volume I, Chapter 1, Section 1.2):

- For a permit to be issued, the project must be in the public interest;
- Permit applications are evaluated to insure that protection of wetlands has been fully considered in project formulation. Great importance is given to the evaluation of alternative sites and project designs which would minimize impacts on wetlands;
- Generally, only water dependent activities in wetlands are permitted unless the proposed activity clearly benefits the public interest. Applicants must provide sufficient information on the need to locate the proposed activity in wetlands. Boat docks, piers, and marinas are examples of water dependent activities. Houses, hotels, and restaurants are considered to be nonwater dependent activities since they do not require the presence of water in order to function;
- Although State permits are a prerequisite for issuance of a Corps permit, State approval does not guarantee issuance of a Corps permit;
- The views of the U.S. Fish and Wildlife Service, the National Marine Fisheries Service, and the U.S. Environmental Protection Agency are important elements of the Corps' permit application review process;
- A permit application may be denied, permitted as proposed, or permitted with modifications or conditions;
- Routine, noncontroversial permit applications usually require three to four months to process. In cases where objections to a project have been raised, additional processing time is usually required to resolve the objections; and
- Proponents of large or complex projects are encouraged to request a pre-application meeting to discuss the proposed project.

A comprehensive public opinion survey of the communities within the study area (Volume II, Chapter 4) strongly supports the preservation of existing wetlands. This sentiment is consistent with the environmentally oriented statutes that have been enacted at the National, State and local levels over the past ten years.

EXECUTIVE SUMMARY

Chapter 1
OVERVIEW

1.1 PURPOSE

In response to an anticipated increase in the number and complexity of permit applications in the Atlantic City area, the Philadelphia District of the U.S. Army Corps of Engineers (Corps), chose to prepare the **Atlantic City Area Wetlands Review**.

The **Review** is a guidance document intended to:

- disseminate information on the Federal permit application review process and on the wetlands of the Atlantic City area;
- indicate, in general terms, the likely action the Corps would take on activities proposed in areas under its jurisdiction;
- provide the Corps with a regional approach to the regulation of activities affecting wetlands within greater Atlantic City;
- provide an assessment of the Atlantic City area; and
- encourage consistency among Federal and State agencies responsible for administering regulatory controls over use of the area's wetlands.

The **Review** is not a new regulatory instrument and does not replace the Corps' review of permit applications on a case-by-case basis.

1.2 CORPS INVOLVEMENT IN THE ATLANTIC CITY AREA

1.2.1 REGULATORY FUNCTIONS (PERMITS) PROGRAM

The Corps' regulatory functions (permits) program requires that it review proposed non-Corps projects affecting the waters of the United States and their adjacent or contiguous wetlands. The authority for the Corps' regulatory program derives from two basic statutory sources:

- Section 10 of the River and Harbor Act of 1899, and
- Section 404 of the Clean Water Act.

In these enactments, Congress delegated responsibility to the Corps for regulating structures or work in or affecting the waters of the United States, and thus, the wetlands of the Atlantic City area. If

such activities would constitute a "major Federal action significantly affecting the quality of the human environment," an Environmental Impact Statement (EIS) would be required as defined in the guidelines of the National Environmental Policy Act (NEPA) of 1969, as amended.

Section 10 of the River and Harbor Act of 1899 prohibits the following:

> ...unauthorized obstruction or alteration of any navigable water of the United States, the excavation from or the depositing of material in such waters, or the accomplishment of any other work affecting the source, location, or capacity of such waters, unless such work has been recommended by the Chief of Engineers and authorized by the Secretary of the Army.
>
> (33 CFR 320.2)

Section 404 of the Clean Water Act of 1977 significantly modified the Corps' authority in wetlands by requiring a Department of the Army permit for the placement of dredged or fill material in waters of the United States. Typical activities regulated by the Corps under the Section 404 program include:

- placement of fill for recreational, industrial, commercial, residential, and other uses;
- causeway or road fills;
- dams and dikes;
- artificial islands;
- property protection and/or reclamation devices such as riprap, groins, seawalls, breakwaters, and bulkheads;
- beach nourishment;
- levees;
- sanitary landfills; and
- backfill required for the placement of structures such as sewage treatment facilities.

As defined by its current rules and regulations, waters under Corps jurisdiction include the following four categories:

- Coastal and inland waters, lakes, rivers, and streams that are navigable waters of the United States including adjacent wetlands.
- Tributaries to navigable waters of the United States including adjacent wetlands.
- Interstate waters and their tributaries including adjacent wetlands.
- All other waters not identified in categories 1-3 such as isolated lakes and wetlands, intermittent streams, prairie potholes, and other waters that are not part of a tributary system to interstate waters or to navigable waters of the United States, the degradation or destruction of which could affect interstate commerce.

(33 CFR 323.2)

In addition to Section 10 of the River and Harbor Act of 1899 and Section 404 of the Clean Water Act of 1977, several other statutory provisions bear upon the Corps' regulatory program. These are reviewed in Vol. II, Chapter 5, Institutional Framework.

Wetlands are defined by the Corps as:

> Those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.
>
> (33 CFR 320)

In this document, the use of the word wetlands generally refers to all areas under Corps jurisdiction, ie. vegetated wetlands such as saltmarsh and swamps, intertidal areas, and aquatic areas such as the open waters of the ocean and the back bays.

Questions regarding the presence or extent of areas under Corps jurisdiction may be answered by contacting the Corps.

1.2.2 PERMIT APPLICATION REVIEW PROCESS

The Corps is the Federal permitting agency for activities affecting waters of the United States and their adjacent wetlands. As such, it is involved in informing other agencies of proposed projects, organizing meetings, and of generally coordinating the Federal review of permit applications.

The Corps' concern in the review of permit applications is the public interest. For a project to be permitted, it must be found to be in the public interest. Further, a project should have no alternative site or design which would allow its removal from wetlands or would lessen its environmental impacts on wetlands. Generally, only water dependent activities are permitted unless the proposed activity clearly benefits the public interest.

Water dependent activities as defined in the Corps' Regulations are those activities which are "primarily dependent on being located in, or in close proximity, to the aquatic environment" (33 CFR 320.4(b) (4)). Boat docks, piers, and marinas are examples of water dependent activities. Houses, hotels, and restaurants are examples of activities which do not require the presence of water in order to function, and, as such, are considered to be non-water dependent activities.

The three Federal agencies with which the Corps coordinates are the U.S. Fish and Wildlife Service, the U.S. Environmental Protection Agency, and the National Marine Fisheries Service. The Federal and State agencies involved in regulating activities occuring in wetlands share information regarding permit requests so that each agency is as informed as possible about the design and implications of each proposed activity.

A flow chart depicting the stages of the permit application review process is presented in Figure 1-1. Each stage of the review process is discussed below:

1.2.2.1 STAGE 1: PERMIT APPLICATION

The Federal government advises proponents of large or complex projects to request a pre-application meeting. The purpose of such meetings is to introduce the proposed project, visit the site of the proposed activity, and to discuss in general terms the anticipated environmental impacts of the proposal. In addition to inviting the four Federal agencies, it is advisable to invite the appropriate State agencies as well. Meetings of this sort assure the government of an understanding of the project and inform the prospective applicant of the concerns of the regulatory agencies prior to formal submission of a permit application.

Following such meetings, project sponsors are more knowledgeable about the permit application review process and are better able to redesign proposals to avoid known adverse environmental impacts. Proponents of inapropriate projects are informed that such activities are typically denied.

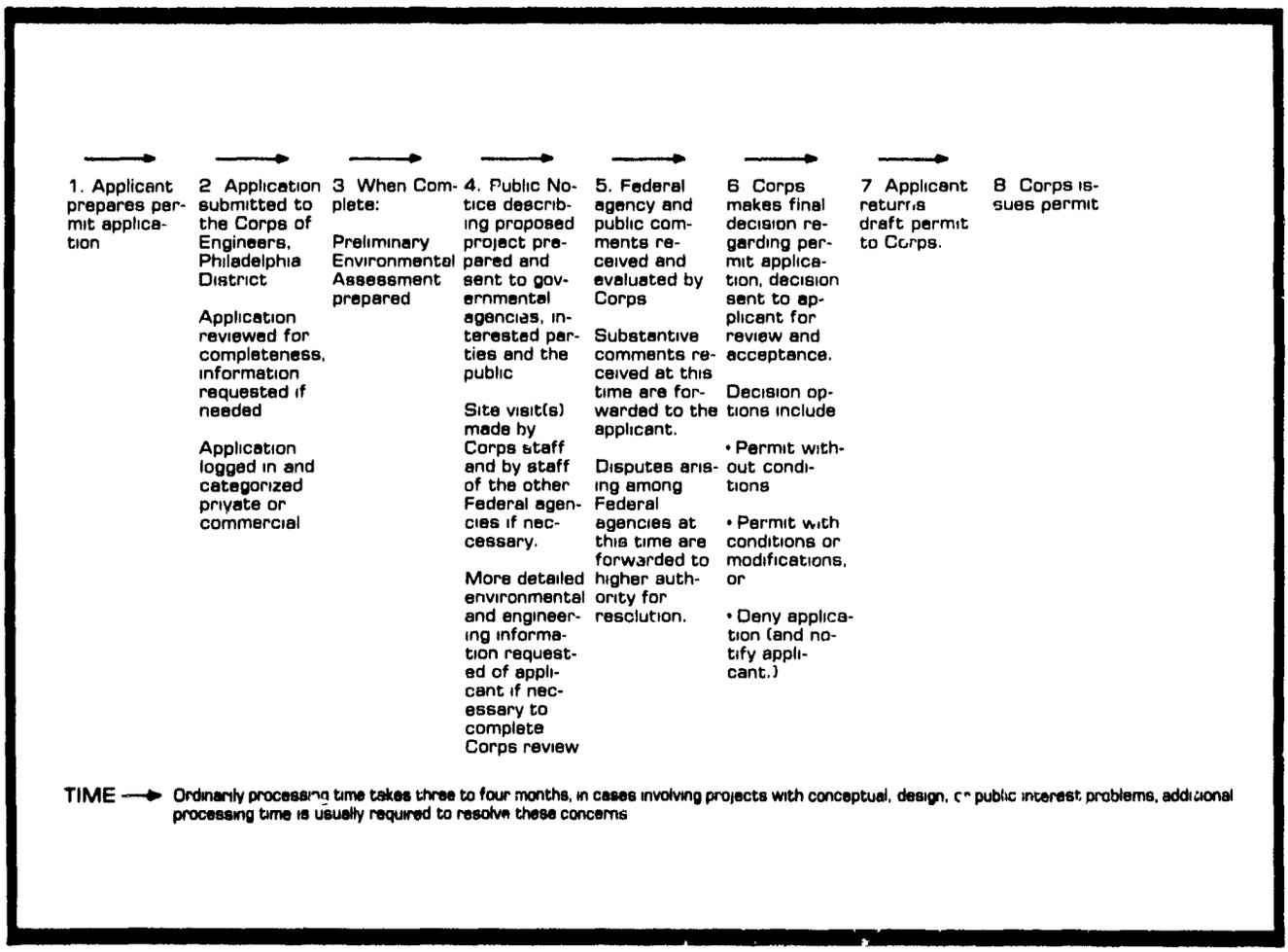
The Federal agencies and the State of New Jersey advise potential applicants that both levels of government have independent permitting processes and that permit applications are reviewed on a case-by-case basis.

1.2.2.2 STAGE 2: PERMIT APPLICATION SUBMISSION

Applications for Corps of Engineers permits should be sent to:
Permits Branch, Philadelphia District,
U.S. Army Corps of Engineers,
Custom House, 2nd and Chestnut Streets,
Philadelphia, PA 19106.

After preliminary review, each application is classified as either "private" or "commercial." This classification depends more on the intended use of the project than with its characteristics of ownership. Those applications classified as private are usually smaller projects proposed by individual homeowners. Most applications received by the Corps fall into this category. The number of large commercial or large private project is relatively small but occupies a proportionately larger amount of time and effort to process.

Applications are reviewed to be sure they are complete. If not complete additional information is requested of the applicant.



PERMIT APPLICATION FLOW CHART **Figure 1-1**

1.2.2.3 STAGE 3: ENVIRONMENTAL ASSESSMENT

An Environmental Assessment is prepared for each project. The Environmental Assessment identifies the applicant, describes the project and the area of the proposed project, and discusses the environmental impacts associated with the project. Recommendations are made to minimize or eliminate adverse impacts if necessary. A determination is also made as to whether the proposed project would significantly affect the quality of the human environment and thus require preparation of an Environmental Impact Statement (EIS).

1.2.2.4 STAGE 4: PUBLIC NOTICE

A Public Notice describing each proposed project is prepared and sent to the U.S. Fish and Wildlife Service, the Environmental Protection Agency, the National Marine Fisheries Service, other governmental agencies, and to the public.

During evaluation of a project, one or more site visits may be made. During site visits, agency personnel usually photograph the site and gather information regarding the biological characteristics of the area. Additional information required to complete project review may also be requested at this time.

1.2.2.5 STAGE 5: AGENCY AND PUBLIC COMMENTS

Federal agency and public comments regarding the proposed project are received by the Corps and considered as part of the permit application review process. All comments to the Public Notice which oppose the project are coordinated with the applicant in an attempt to resolve them. Federal agency comments and the comments from the general public are treated in the same manner.

Differences of opinion among the Federal agencies concerning a decision on a permit application are usually resolved in discussion at the local level. Should disputes not be resolved, however, they are elevated to higher administrative levels, and if necessary, to the Secretary of the Interior and the Secretary of the Army in Washington for final determination.

Typically, permit processing may take several months or longer to complete. In cases of projects with conceptual, design, or public interest concerns, additional processing time is usually required to resolve these matters.

1.2.2.6 STAGE 6: DECISION

The Corps makes a final decision on each project and forwards its decision to the applicant. The decision may be to issue a permit without conditions, to issue a permit with conditions, or to deny the permit request.

1.2.2.7 STAGE 7: APPLICANT REVIEW OF THE DRAFT PERMIT

The applicant reviews the draft permit and any accompanying draft permit conditions. If there are disagreements between the applicant and the Corps, they are resolved (hopefully) and the final design of the project and the permit conditions determined.

1.2.2.8 STAGE 8: PERMIT ISSUANCE

The Corps issues a permit for the proposed project.

The past record of the Philadelphia District's permit program indicates that most permit application requests are permitted. In 1978, only 16 of 1,242 permit applications were denied. In the same year, over 100 applications ultimately approved were substantially modified during the review process.

1.2.3 ROLE OF COOPERATING FEDERAL AGENCIES

In addition to its own analysis of proposed projects, the Corps must seek comments from its three "sister agencies," the U.S. Department of the Interior, Fish and Wildlife Service; the U.S. Environmental Protection Agency; and the U.S. Department of Commerce, National Marine Fisheries Service (NMFS). Though the charges of the four agencies are different, the comments of each of the four agencies are considered equally in the permit application review process.

1.2.3.1 U.S. FISH AND WILDLIFE SERVICE

When reviewing permit applications, the U.S. Fish and Wildlife Service evaluates the fish and wildlife resources of the project area and assesses the project's impacts on these resources. The Service then provides recommendations to the Corps that would protect, preserve, and possibly enhance the affected fish and wildlife resources.

The Service's policy is to encourage the preservation, restoration and improvement of fish and wildlife resources for the benefit of all citizens. Consequently, the Service encourages developers to use all possible methods and alternatives, including nondevelopment, to prevent adverse environmental impacts. The Service strives to ensure that all project alternatives are the least environmentally damaging, and that all works are in the public interest with respect to the environment. When reviewing permit applications, the Service considers:

- whether the project is water dependent;
- the long-term effects of the proposed activity; and
- its cumulative effects when viewed in relation to other existing or proposed activities.

The Fish and Wildlife Service discourages activities in or affecting the Nation's waters and wetlands which would, individually or cumulatively, unnecessarily destroy, damage, or degrade naturally functioning aquatic and wetland ecosystems including their fish and wildlife resources.

Any of the following situations may serve as a basis for a Service recommendation of denial of a Corps permit:

- The project would directly destroy, damage or degrade fish and wildlife, their habitat, or other significant environmental values including part or all of a naturally functioning ecosystem;
- The project would lead to, encourage, or make possible the destruction, damage or degradation of fish and wildlife habitat or other significant environmental values including part or all of a naturally functioning ecosystem;
- The project purposes are not water related or water dependent;
- Alternative upland sites are available for the proposal which would involve less environmental damage and would better satisfy the public interest;
- Public use of a natural resource would be restricted or curtailed; and,
- Ignoring private gains not clearly related to health, safety or protection of property, public benefits would not clearly exceed public losses in regard to fish and wildlife resources and their habitats.

The Service's guidelines for proposals in or affecting waters of the United States are published in the Federal Register, Vol. 40, No. 231, December 1, 1975.

1.2.3.2 U.S. ENVIRONMENTAL PROTECTION AGENCY

The U.S. Environmental Protection Agency (EPA), Region II, New York, New York, is concerned with matters relating to air and water quality. Their involvement in proposed projects is greater when there is clear potential for the degradation of water quality on either a short-term or long-term basis.

1.2.3.3 NATIONAL MARINE FISHERIES SERVICE

The National Marine Fisheries Service, with a field office located in Sandy Hook, New Jersey, is concerned with all aspects of wetland protection which relate to the well-being of finfish, shellfish, and marine mammals at all stages of their life cycle, and with the passageways of anadromous and catadromous fish.

The National Marine Fisheries Service classifies projects into three categories:

- The first category involves an "in-depth" analysis of proposed projects including an investigation of the project site and preparation of a literature search. The design and environmental impacts of proposed projects are reviewed and evaluated, and the findings shared with cooperating local,

State, and Federal agencies. A report on each project, including NMFS recommendations, is sent to the Corps as part of their coordination effort.

- The second category involves a "moderate" review of the permit request which is a less rigorous effort than in-depth analysis but includes first-hand knowledge of the area and evaluation of the project's potential environmental impacts. The size of these projects is typically smaller and design specifications are more routine than the projects placed in the first category. Coordination with fewer agencies is required.
- The third category involves "minimal handling" of project proposals. Applications are treated in one of two ways: they are screened out as not requiring a response or are given a cursory review and responded to with a form letter.

During the four year period from fiscal year 1973 through fiscal year 1976, forty-nine percent (49%) of applications received by the Northeast Region of NMFS, which includes the Sandy Hook office, were placed in either the in-depth analysis or moderate handling categories.

1.2.4 NEW JERSEY'S REGULATORY PROGRAM

Two distinctions should be made between the regulatory program of the State and that of the Federal government. First, the State of New Jersey may require that an applicant obtain one or more permits depending upon the nature and location of the proposed activity. The Federal process, however, involves issuance of only one permit by the Corps. The second distinction is that issuance of a Corps permit is contingent upon the receipt of all necessary State permits. It is possible, however, that the Federal agencies could require alteration of a project prior to issuance of a Corps permit even though the project sponsor has received all necessary State permits.

The State permitting process administered by the Department of Environmental Protection (DEP) is concerned with protection of the general welfare of the State of New Jersey. See Section 1 7 of this chapter for further discussion of New Jersey's Coastal Zone Program.

1.3 STUDY APPROACH

Preparation of the **Atlantic City Area Wetlands Review** followed a three-step approach:

First, the boundaries of the study area were defined to include the region between the Brigantine National Wildlife Refuge to the north, the Cape May County Line to the south, the Atlantic Ocean (1500 feet offshore) to the east, and the vicinity of Route U.S 9 to the west (Figure 1-2) The western boundary was refined to encompass the watersheds of Patcong Creek and Absecon Creek as they extend upstream to Bargaintown Pond and the Atlantic City Reservoir, respectively.

Second, the study area was divided into primary and secondary areas. This distinction was made on the basis of the Corps' jurisdictional authority. Primary areas represent all waters and wetlands under Corps jurisdiction. Secondary areas are composed of uplands which lie outside Corps jurisdiction but are within the study area.

Third, the **Review** advanced to the three phase process shown in Table 1-1 and described below.

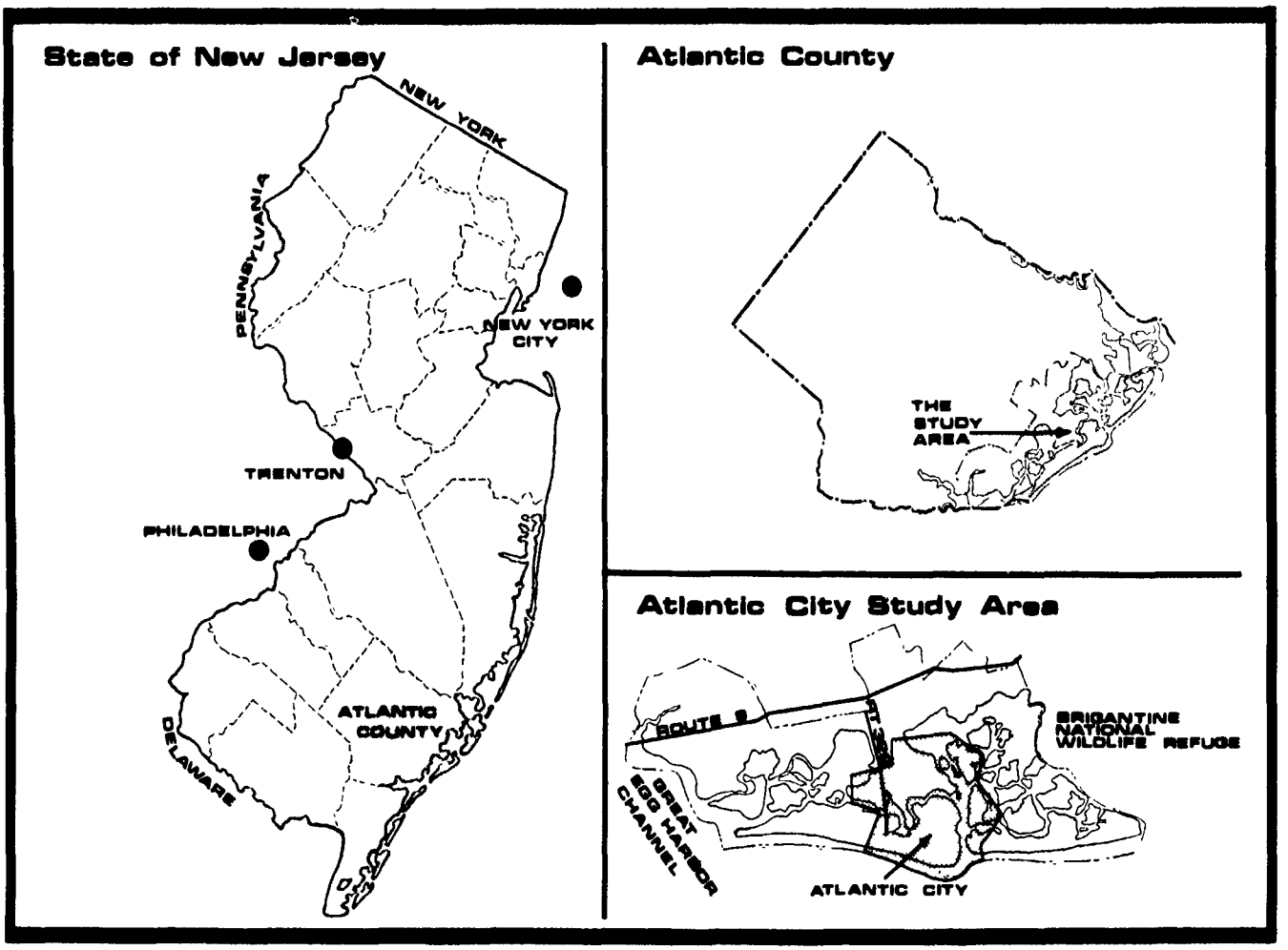
1.3.1 PHASE I

In order to provide a descriptive account of conditions within the study area, data was compiled and profiles were prepared. The profiles, contained in Volume II, involve three major categories:

- the Physical Environment,
- the Biological Environment, and
- Land and Water Use.

Each profile is presented in both textual and graphic form. Foldout maps are at a scale of approximately one inch equals one mile.

In addition to preparation of the profiles, a public opinion survey of the greater Atlantic City area was conducted. A description of this survey, characterization of its respondents, and summary of results is presented in Vol. II, Chapter 4, Public Opinion Survey.



LOCATION MAP/REGIONAL SETTING **Figure 1-2**

Table 1-1 **ATLANTIC CITY AREA WETLANDS REVIEW PROJECT STRUCTURE**

Phase I	Phase II	Phase III
DATA INVENTORY	**CLASSIFICATION OF LANDS AND WATER**	**PERMIT EVALUATION CRITERIA**

PREPARATION OF PROFILES:
• Physical
• Biological
• Land and Water Use
 	
CONDUCT PUBLIC OPINION SURVEY
	ANALYSIS AND CLASSIFICATION:
	• Areas Not Under Corps Jurisdiction
	  • Areas of High Density Development
	  • Areas of Low Density Development
	• Areas Under Corps Jurisdiction
	  • Wetlands of Importance
	  • Wetlands of Concern
		EVALUATION OF ACTIVITIES IN WETLANDS:
		• Acceptable Generally (AG)
		• Acceptable Generally with Conditions (AC)
		• Unacceptable Generally (UG)
		
		PRESENTATION OF ACTIVITY DESIGN CRITERIA INCLUDING SPECIAL EMPHASIS OF MOORING FACILITIES

1.3.2 PHASE II

From the inventory base, prominent resource characteristics were identified and areas were categorized in terms of their jurisdictional status and environmental value.

Study area wetlands are classified in two categories:

- **Wetlands of Importance**: essentially unaltered wetland areas where certain types of permit requests would ordinarily be denied, and
- **Wetlands of Concern**: disturbed wetland areas where permits for certain types of activities would ordinarily be granted or granted subject to conditions.

NOTE: *See the **STUDY AREA BASE MAP** under separate cover*

1.3.3 PHASE III

The final phase of preparation of the **Review** involved:

- The integration of information generated by the resource profiles, public opinion survey, area classifications, and special studies;
- The identification and definition of activities commonly proposed in the wetlands of the study area;
- The identification of the general acceptability of each activity defined above in regard to the wetlands of the study area.

- The preparation of design criteria for each activity defined; and
- The preparation of a special study of Mooring Facilities.

1.4 FEDERAL POLICIES

Four Federal policies provided the framework for preparation of the **Review**. They are:

- Coastal wetlands are valuable natural resources. Their values in regard to biological productivity, water purification, hydrologic regulation, shore protection, outdoor recreation, and other values warrant conservation.
- The National, State, and local interest in maintaining the ecological integrity of wetland resources underlies the public goal which seeks to minimize alteration of their natural state.
- The value that the public ascribes to wetlands and related resources should be based upon comprehensive considerations inclusive of physical, biological, and socioeconomic parameters.
- Preparation of an Environmental Impact Statement (EIS) would be required of proposed projects which would significantly affect the quality of the human environment.

1.5 STUDY ASSUMPTIONS

A number of working assumptions were used in the preparation of the **Review**. They are:

- In combination with existing Federal regulations, the classification of areas based upon an evaluation of their resource characteristics and ecological functions is sufficient to serve as a general guide for regulatory decisions regarding the appropriateness of proposed projects and the design standards which would be applied to them.
- All proposed projects would continue to be reviewed on an individual case-by-case basis.
- The advent of casino gambling will transform the Atlantic City area's seasonal tourist industry into a year-round tourist industry.
- Atlantic City and surrounding communities will be subject to substantial primary and secondary development pressures generated by casino-hotel development.
- The existing shortage of boat mooring and storage facilities within the study area will continue and perhaps increase.
- Some portion of what is currently wetlands will likely be lost to development.
- Periodic dredging, particularly maintenance dredging, and the consequent disposal of dredged material will occur.
- There will be no new highway connection out of Brigantine other than what presently exists or an upgrading of it. The highway which was proposed to connect Route 40/322 with Route 563 and Margate, and for which the intersection on Route 40/322 has been constructed, will not be built.
- The Absecon Bay-Reeds Bay-Grassy Bay complex is effectively a separate subsystem from the Lakes Bay-Scull Bay complex.
- Benthic populations and fishery resources within the study area are relatively homogeneous.
- The back bays are highly productive clam areas.
- The new regional sewerage treatment plant will continue to improve the water quality of the back bays.

1.6 DESCRIPTION OF THE STUDY AREA

The presentation of natural and cultural features within the study area is divided into three major parts. They are:

- the barrier islands,
- the back bays, and
- the mainland.

Each area is briefly discussed below:

1.6.1 BARRIER ISLANDS

Within the study area are two barrier islands, Brigantine Island to the north and Absecon Island to the south. Densely developed, Absecon Island is the hub of the study area. It is also the location of Atlantic City, the study area's largest seashore resort community and the center of casino gambling activity.

Directly offshore Atlantic City at a distance of 70 miles is the Baltimore Canyon Trough. This area is known historically for its plentiful fishery resource, and more recently, as a frontier for oil and gas exploration.

1.6.2 BACK BAYS

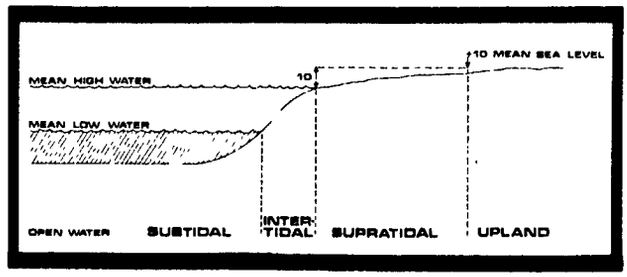
The back bays are located between the barrier islands and the mainland. An estuarine system, the back bays are predominantly saltmarsh intersected by an intricate network of watercourses, tidal flats, and islands. Most of this area is regularly submerged by tidal waters; the ebb and flow of the tide producing constant fluctuation between subtidal (below mean low water level) and supratidal (above mean high water level) areas (Figure 1-3). With a few exceptions, the back bays remain undeveloped.

Linking the Atlantic Ocean with the back bays is a series of oceanic inlets. From northeast to southwest these are: Brigantine Inlet, Absecon Inlet, and Great Egg Harbor Inlet. The latter leads to Great Egg Harbor Bay, one of the largest estuaries along the New Jersey shore.

Located at the mainland edge of the back bays is a series of relatively large open water bodies: Reeds Bay and Absecon Bay in the northeast, and Lakes Bay and Scull Bay in the southwest. These two pairs of bays are effectively separated into two subsystems by the transportation corridor which supports Route 30, Route 322, and the Atlantic City Expressway.

1.6.3 MAINLAND

Westward of the back bays lies the mainland. This land area features several mid-sized suburban communities whose town centers and residential areas merge with more rural surroundings to the north and west.



CROSS-SECTION **Figure 1-3**

** + 10 feet MSL is the height of the 100 year flood.*

Two major drainage basins lie within the mainland portion of the study area: Absecon Creek which drains into Reeds Bay and Patcong Creek which drains into Great Egg Harbor Bay. Within the study area, both creeks are tidal with drainage areas characterized by bands of lowlying wetlands.

1.6.4 ACCESS TO THE STUDY AREA

The study area is served by a well established transportation network with access routes by road, rail, air, and water. Major highways leading to the Atlantic City area include the Garden State Parkway and Route 9 from both north and south. Route 322, Route 30, and the Atlantic City Expressway enter Atlantic City from the west. Further south, Route 152 carries traffic from Ocean City and Somers Point to Longport. Route 563 connects Northfield with Margate. One dead-end highway link extends from Atlantic City north into Brigantine. Access to the study area by air is through Bader Field located in Atlantic City and through the National Aviation Facilities Experimental Center (NAFEC)-Atlantic City Airport which is located approximately seven miles inland from the study area. In addition, the New Jersey Intracoastal Waterway (NJIWW) passes through the back bays adjacent to Brigantine, Atlantic City, Ventnor, Margate, and Longport.

Atlantic City occupies a strategic position among eastern seaboard cities, proximate to such major centers of industry, commerce, and government as Philadelphia (60 miles), Trenton (75 miles), New York City (112 miles), and Washington, DC (202 miles). Figure 1-2 illustrates the study area's position within the State of New Jersey.

1.6.5 MUNICIPALITIES OF THE STUDY AREA

Politically, the study area is composed of all or parts of twelve separate municipalities:

the City of Brigantine,
the City of Atlantic City,
the City of Ventnor,
the City of Margate,
the Borough of Longport,
the Township of Egg Harbor,
the City of Somers Point,
the City of Linwood,
the City of Northfield,
the City of Pleasantville,
the City of Absecon, and
the Township of Galloway (Figure 1-4).

In terms of population, Atlantic City is the largest municipality with approximately 44,000 residents. Longport is the smallest with a population of 1,700. The remaining ten communities range in size of population from 4,500 to 14,500 individuals.

1.6.6 SOCIOECONOMICS OF THE STUDY AREA

From a socioeconomic perspective, the study area is emerging from a long period of slow growth. Whereas historic rates of increase in terms of income, employment, and population in Atlantic City have not kept pace with those of either Atlantic County or of the State, the prospect for relatively rapid rates of future growth is at hand. This prospect derives primarily from the advent of casino gambling in Atlantic City. Although casino-hotel development will do much to upgrade the previously deteriorating economic base of Atlantic City, the fact that Absecon Island (notably Atlantic City) has small amounts of vacant, developable land will cause population growth to be deflected into the surrounding area. Study area communities expected to absorb the largest amount of projected residential development are the Township of Egg Harbor, the Township of Galloway, and the City of Brigantine.

The prospect of future growth within the study area is best explained by examining the relationship between casino-gambling and the recreation-resort industry. As the area's leading economic sector in terms of income and employment, the recreation industry has long been hindered by seasonal fluctuations in the number of tourists visiting the area. As a year-round leisure-oriented activity, casino gambling will tend to alleviate seasonal irregularities in the number of visitors, increase the City's attraction as a convention center, and contribute appreciably to the area's economic stability.

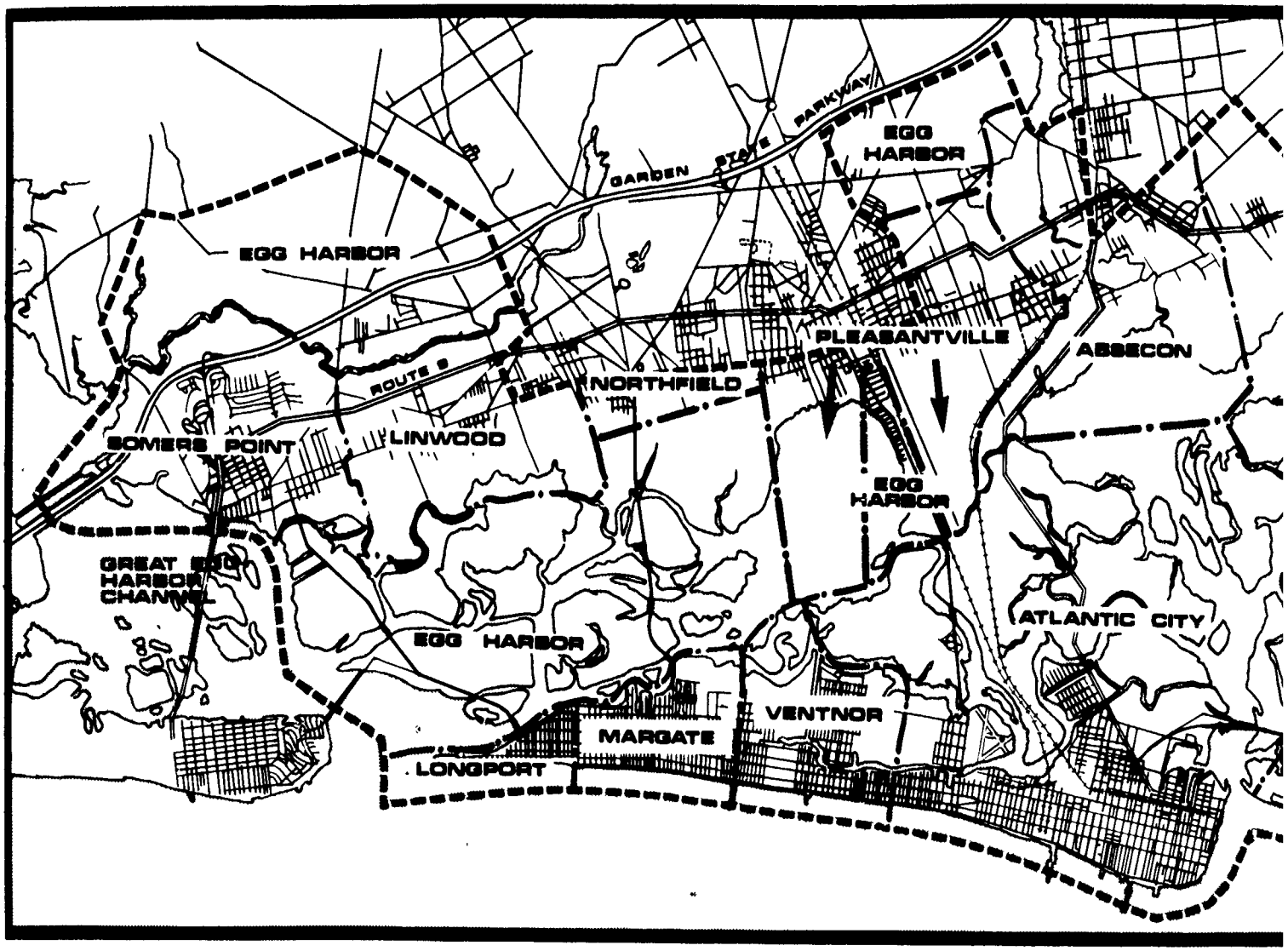
Growth of the recreation industry of the Atlantic City area carries with it certain implications for the Corps. Existing patterns of outdoor recreation in the study area are disproportionately comprised of water-oriented activities, particularly motor boating and fishing by boat. These and related forms of marine recreation require an extensive support system including launching, mooring, storage, maintenance, and repair facilities. Within the Atlantic City area, however, a deficit of such facilities exists, both in terms of present and projected levels of demand. This market shortage in the supply of marine recreation support facilities implies a potential increase in the number of permit applications for the construction, expansion, and repair of docks, piers, ramps, and bulkheads; and for related activities under Corps jurisdiction.

1.6.7 ATLANTIC CITY

1.6.7.1 LAND AREA

Atlantic City encompasses an area of 7,640 acres. The urbanized portion of Atlantic City is composed of approximately 2,608 acres, or one-third the City's total area. According to the existing zoning map, the urbanized area is apportioned among five major classifications of land use:

- Single family residential (24%),



ATLANTIC CITY AREA WETLANDS REVIEW

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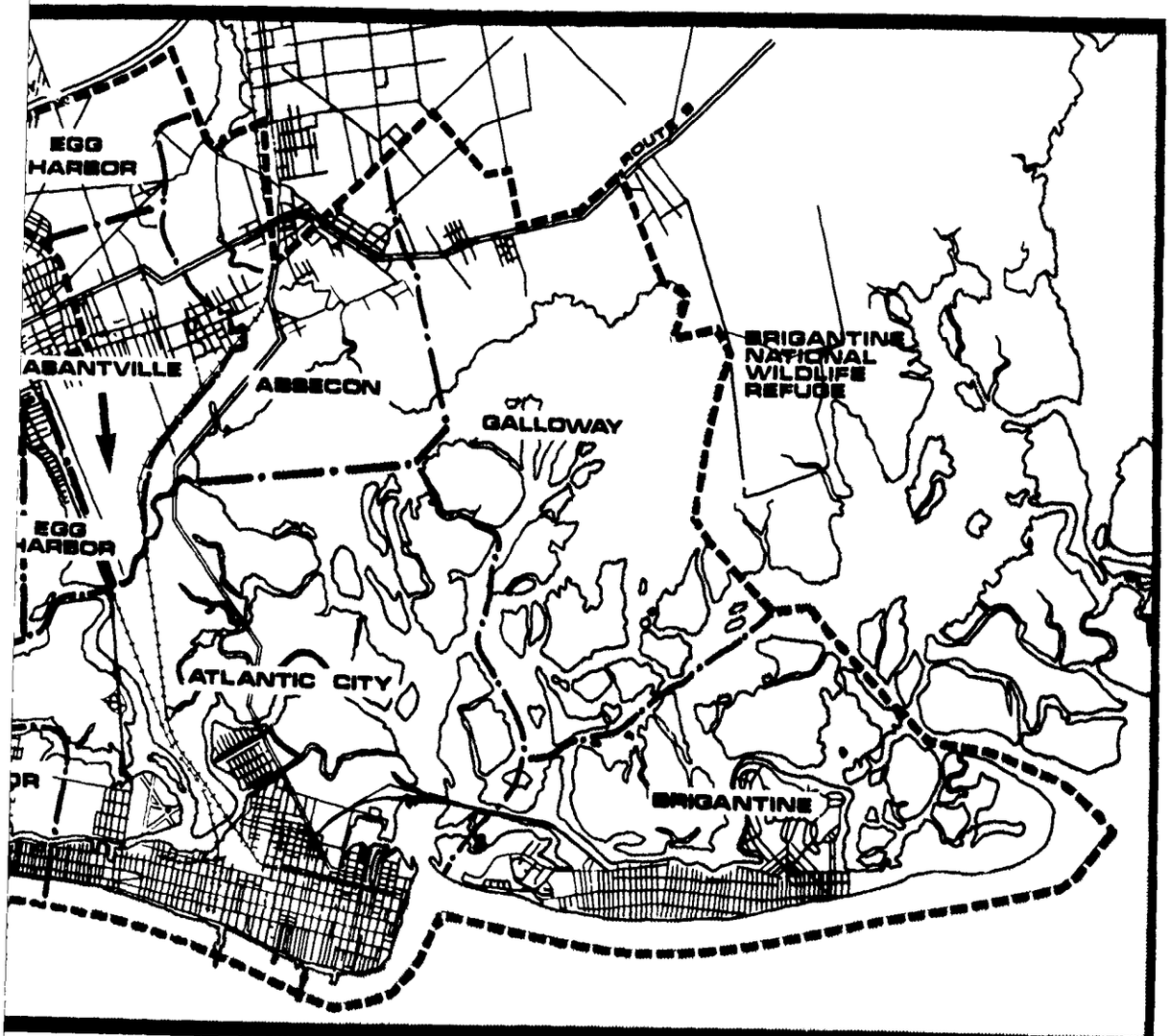


STUDY AREA COMMUNITIES

Figure 1-4

6.2.2 Atlantic City

- Multiple family residential (24%),
- Commercial (20%),
- Resort commercial (18%), and
- All other uses (14%)

Development patterns within Atlantic City have long been dominated by commercial activities along the City's famed boardwalk. Bands of less intensive commercial and residential development are evident at more inland locations and along the City's bayfront. Land use patterns are changing rapidly, however, as reflected by the rising land values and frequent title transfers on certain portions of the island. Prospective development pressures have made land a scarce and valuable resource. The legalization of casino gambling and the consequent introduction of large-scale casino-hotel, resort, and marina projects has compounded the demand for developable parcels and caused land prices to skyrocket.

Approximately 70 percent of Atlantic City's total land and water area is currently classified as marine tidal marsh. The bulk of Atlantic City's wetland areas lie in the western portion of the City, much of which is bounded by resort-commercial districts. In addition to several miles of sandy beach, there are more than 11 miles of inland waterways which front on existing urban areas.

1.6.7.2 POPULATION

The population of Atlantic City decreased from 61.657 in 1950 to 59,544 in 1960 to 47,859 in 1970. This 22.4 percent decline in population corresponded to the diminishing employment opportunities of an eroding economic base and to the nationwide trend toward suburban residence.

Significant age composition changes have accompanied the erosion of Atlantic City's tourism industry during the past decade. During the 1960's the area sustained marked losses in specific age groups, particularly those of wage earning capacity (25-34, 35-44 and 45-54). Individuals in the 65 and over age bracket increased, however, from 18 percent in 1960 to 25 percent of the total population in 1970. A comparison with state and county population data shows Atlantic City to have a disproportionately high proportion of females, non-whites, and persons in the 65 and over bracket. These three groups constitute 56.2 percent, 45 percent, and 25 percent of the total population, respectively.

In response to developments associated with casino gambling, the prospect for growth in Atlantic City has greatly improved. Summarized in the Table below, Atlantic City's population is projected to increase at an average annual rate of 3.3 percent through 1990.[1]

POPULATION PROJECTIONS FOR ATLANTIC CITY, 1982-1990

Year	*Population*
1982	48,844
1985	53,644
1990	63,644

[1] By 1982, the Planning Department of Atlantic City estimates that at least 15 casinos will be open in Atlantic City It is estimated further that each casino will generate some 4,000 jobs which would result in the creation of approximately 60,000 casino related positions by the target year These opportunities would cause an increase in the area's work force and, concomitantly, an increase in population (Source Correspondence from Jay Fiedler, Acting Director, Planning Board, Suite 304-305, City Hall, Atlantic City, N J , to Jeffrey Steen, Corps of Engineers, Feb. 6, 1980)

Within Atlantic City, population growth is likely to be constrained relative to the increase of employment opportunities because of the limited availability of land. According to a Gladstone Associates analysis, an estimated 200-400 acres of land for new residential construction might be available by 1990. Development costs associated with new residential construction, as well as municipal policies regarding residential densities are major uncertainties governing the magnitude, timing, and pattern of anticipated population growth. If only 200 acres are available for new residential construction through 1990 and a policy of low density residential development is pursued, the population in Atlantic City will rise to only 52,000. If 400 acres are available, the population could reach 70,600 by 1990. Future population levels within Atlantic City depend in major part on the City's apportionment of land for residential, commercial, and other uses.

1.6.7.3 EMPLOYMENT

Though characterized by seasonal variation, Atlantic City hosts 42 percent of all employed persons in Atlantic County. The labor force participation ratio for Atlantic City indicates that 31.9 percent of its total population is employed. A closer look at employment statistics indicates two striking differences between Atlantic City and the rest of the County:

- the low male labor force participation ratio of 43.0 percent, and
- the corresponding above-average labor force participation ratio for females of 35.4 percent.

High levels of unemployment have long plagued Atlantic County and Atlantic City where they have been a particularly severe problem. On the average, unemployment rates are 6 percent higher for Atlantic City than for surrounding communities. It is expected, however, that the direct and indirect effects of casino-hotel development will appreciably lower the City's typically high rate of unemployment.

The employment breakdown for Atlantic City is:

Agriculture, Forestry, Mining	0.1%
Contract Construction	2.6%
Manufacturing	7.3%
Transportation, Communication and Utilities	6.8%
Wholesale Trade	3.9%
Retail Trade	26.8%
Finance, Insurance, Real Estate	6.7%
Services	36.0%
Government and Other	9.8%
TOTAL	100.0%

The prospective levels of economic activity generated by casino-hotel development are expected to be extraordinary. The City's 10 to 30 casino-hotels are expected to revitalize the tourist trade and spur growth of employment opportunities generally. The infusion of casino gambling into the local economy is expected to boost visitation levels from approximately 2.0 million visitors annually to approximately 10.0 million annually. Economic Research Associates estimates that the revitalization of Atlantic City's tourist industry could create approximately 70,000 jobs by 1990.

In addition to the direct and indirect occupational opportunities generated by the increased tourist trade and support activities, there is the prospect of economic development resulting from offshore oil and gas exploration. Although the present economic stimulus provided by offshore energy production is minor and uncertain relative to casino-hotel development, the growth prospects for Atlantic City are nonetheless great. All indicators point to Atlantic City entering a new era of economic growth.

1.6.7.4 INCOME

Of all communities within the study area, the population of Atlantic City is the poorest. According to the 1970 Census, 16.9 percent of the City's families were below the poverty level. This figure is three times that of the State average. Both the mean and median family income in Atlantic City are also well below the State and County averages. In 1970, the percentage of families reporting an income above $15,000 was 8.8 percent for Atlantic City, 17.4 percent for Atlantic County, and 29.5 percent for the State.

A breakdown of economic conditions within the City is presented in Figure 1-5. The City is divided into 21 census tracts which correspond roughly to neighborhood communities. Each tract is

ranked in terms of mean family income. The percentage of poverty class families within each neighborhood is indicated in parentheses

1.6.7.5 ZONING AND FUTURE PLANS

In order to regulate the rapid growth spurred by the legalization of casino gambling, Atlantic City extensively revised its planning program. The updated program consists of several major components: Master Plan, Land Use Ordinance, Zoning District Map, and Capital Improvements Program. Together, the above cited documents form an omnibus package of policy statements, goals, standards, and action strategies which serve as an "instrument through which to attain balance and efficiency in the social and physical organization of the City, and the quantity and variety of activities, accommodations and services offered by such planned organization" (Atlantic City Master Plan).

The Master Plan states Atlantic City's policy regarding all aspects of its future growth and development. Its primary aim is to ensure that the City's casino gambling, convention business, and tourist activities achieve the social, economic, transportation, energy, and environmental goals of the community.

With respect to the physical environment, the Master Plan states:

> The citizens of Atlantic City recognize and assign high importance to the geography, physiography and ecology of their lands, their beaches, the inland waterways, the extensive wetlands, and the sensitive make-up of nature's physical matrix. It is a central objective of the Plan to treat nature as a unique resource, inextricably connected to the City's existence and prosperity as a major resort.

Among its many environmental goals, the Plan contains one statement which specifically addresses wetlands:

> To preserve and protect the sensitive and necessary physiography of the tidal marshes and wetlands. Careless development and incursion into pristine areas of this marine environment may have adverse impacts not only on the land, but also upon the vegetative and wildlife associations of that land

The principal instrument for implementing the themes and concepts presented in the Master Plan is the Zoning Ordinance and Map which regulate the type, quantity, and intensity of development permitted within a given area. As stated in the Zoning Ordinance, the City's policy in regard to wetland protection is to:

> . . . Promote the conservation of open space and valuable natural resources and prevent urban sprawl and degradation of the environment through improper use of the land

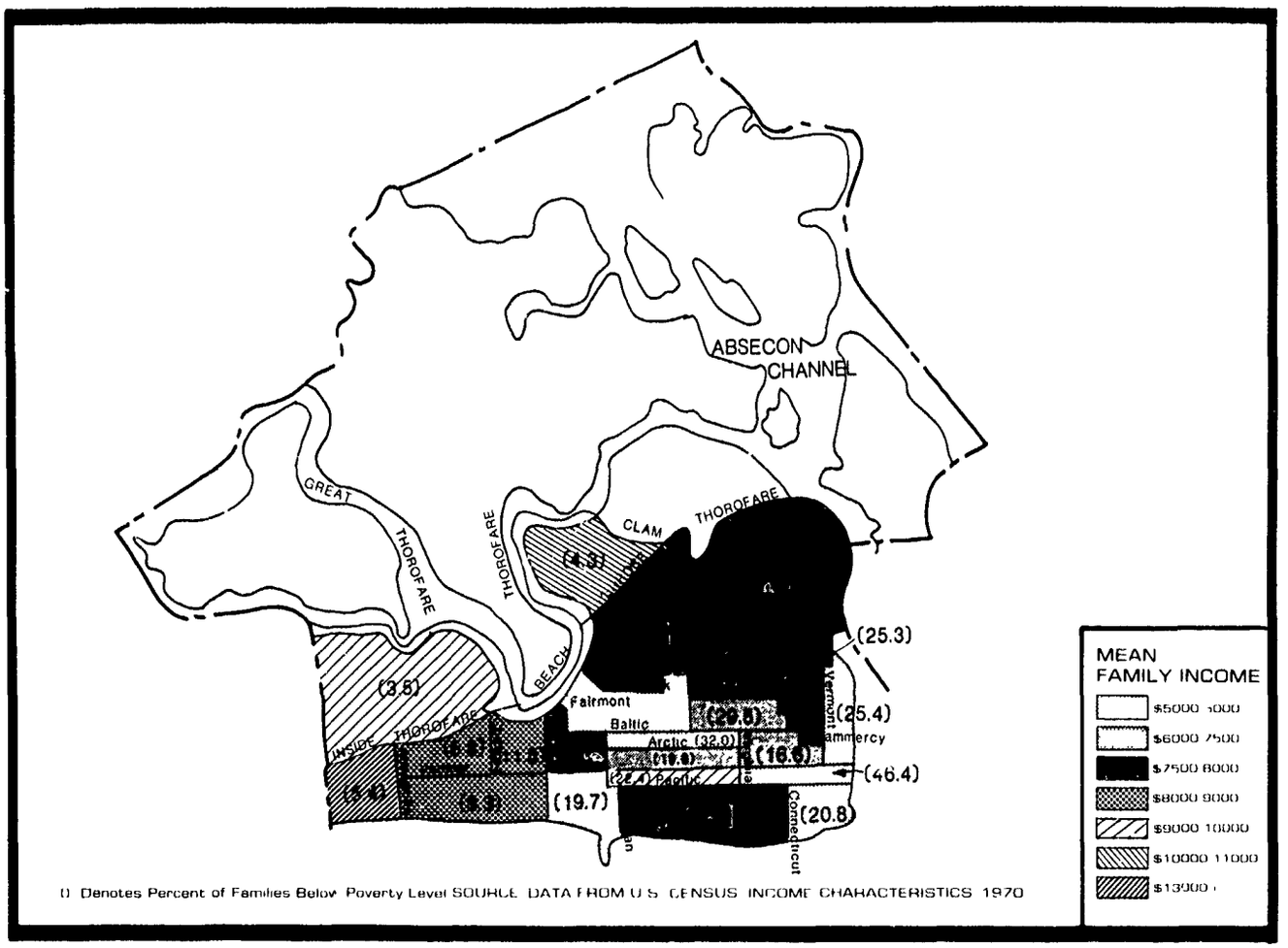
Local provisions for the protection of Atlantic City's wetland resources is limited. Wetlands within the corporate boundaries of Atlantic City are designated by the Zoning Map as Marine Tidal Marsh (MTM) Districts. The regulation and protection of these lands, however, is the responsibility of State and Federal levels of government. Section 4-604 of the Atlantic City Land Use Ordinance states:

> The Marine-Tidal-Marsh (MTM) District has been established to include those land areas in the City that are classified as environmentally sensitive and critical to the ecosystems by Federal and State statutes, which in turn define and regulate such areas.

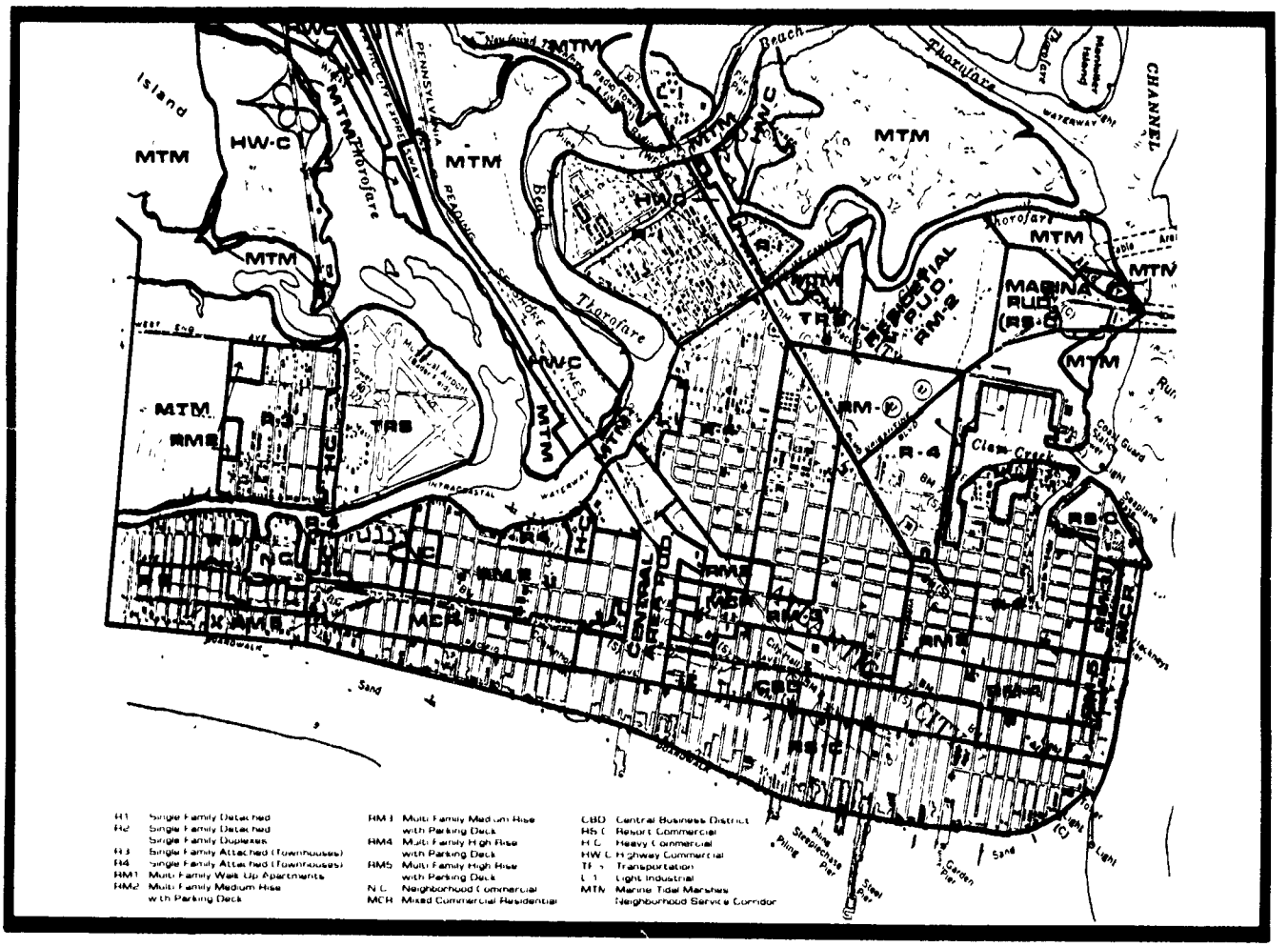
The Atlantic City Zoning Map (Figure 1-6) indicates the extent and location of MTM Districts.

1.7 THE PUBLIC TRUST, RIPARIAN RIGHTS, AND THE STATE OF NEW JERSEY'S COASTAL ZONE PROGRAM

Much of England's common law tradition has been incorporated into the United States' legal system. For the purposes of the **Review**, two common law concepts are noted in order to under-



INCOME DISTRIBUTION/ATLANTIC CITY NEIGHBORHOODS **Figure 1-5**



ATLANTIC CITY ZONING MAP

Figure 1-6

stand the authorized responsibilities of the Corps of Engineers within its historical, philosophical, and legal contexts. These are the "Public Trust Doctrine" and the "Riparian Rights Doctrine." The former serves as a basis for public regulatory constraints on the use of certain land and water resources. The latter underlies the set of public property rights commonly associated with riparian land ownership.

The Public Trust Doctrine, as derived from English common law, held that title to the shores of the ocean, the arms of the sea (rivers and estuaries), and the soil under tidal waters was vested in the king. That is, the king had a proprietary interest, known as *jus privatum*, in these tidelands. Although the king could grant or dispose of this proprietary interest, it was well established that the exercise of proprietary rights should not interfere with the public right to use these lands and waters for navigation, fishing, and similar purposes. Tidelands were resources vested with a public trust.

A philosophical explanation of the Public Trust status accorded riparian resources was provided by J. A. Holmes, Secretary to President Theodore Roosevelt's National Conservation Commission, in 1909:

> The resources which have required ages for their accumulation, to the intrinsic value and quantity of which human agency has not contributed, for which there are no known substitutes, must serve as the welfare of the Nation. In the highest sense, therefore, they should be regarded as property *held in trust* for the use of the Nation, rather than for the benefit of a few individuals who may hold them by right of discovery or purchase.

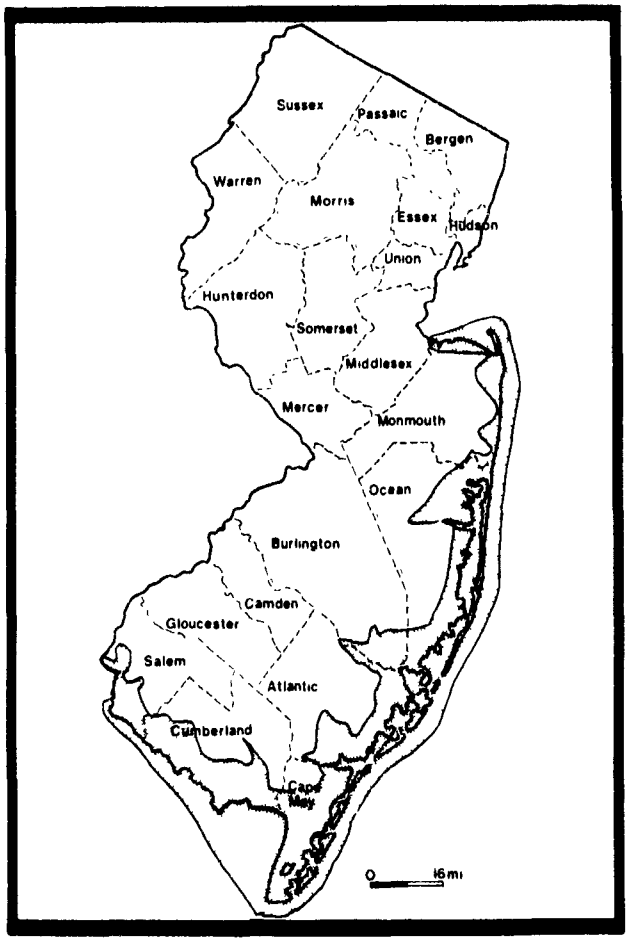
The philosophy of the Public Trust Doctrine has been encoded in several New Jersey statutes, many of which are applicable to properties within the study area. Noteworthy in this respect are the Coastal Area Facility Review Act (CAFRA), the Wetlands Act, the Shore Protection Law, Riparian Statutes, and the Procedural Rules and Regulations for implementing these laws. Case law as derived from judicial decisions in New Jersey courts further refines the Public Trust Doctrine in terms of beach access, recreational uses, aesthetics, navigation, commerce, fishing, and other rights of the public at the water's edge.

Presently, the State of New Jersey is actively engaged in establishing its claim of ownership to riparian lands. Riparian lands are defined as lands now or formerly covered by tidal waters. Under this definition, the mean high tide line marks the line between public and private ownership. Riparian lands along any intertidal waterway are owned by the State. Permission to develop or otherwise improve riparian lands must be secured through the New Jersey Department of Environmental Protection (NJDEP), Bureau of Tidelands. This Bureau serves the Tidelands Resource Council which makes decisions on the sale and leasing of state-owned tidelands. Wetland projects must also be reviewed and approved by the NJDEP, Bureau of Coastal Project Review. The Bureau provides clearance for CAFRA, wetlands, and waterfront development permit applications in conformance with applicable legislation, regulation, and the State's Coastal Resource and Development Policies (Figure 1-7).

CAFRA permits are required for the following types of facilities:

- Electric power generation including oil, gas, coal fired, or nuclear facilities;
- Public facilities and housing including housing developments of 25 or more dwelling units, roads and airports, parking facilities with 300 or more spaces, waste water treatment systems, and sanitary landfills;
- Food and food by-products production, paper production and agri-chemical production;
- Mineral products, chemical processes, metallurgical processes and inorganic salt and salts manufacture; and
- Marine terminals and cargo handling facilities, and storage facilities.

Private property rights are subsidiary to public rights concerning the use of riparian lands in New Jersey. Whereas the common law concept of riparian rights limited the private use of shoreline property to activities which did not "diminish the quantity or quality" of the resource, New Jersey statutes have imposed further restrictions on the use of riparian lands. Establishing the right of the public to riparian lands and related resources as paramount, the cumulative effect of these statutes is to subject the use of riparian lands to a variety of trusteeship considerations. In general, the acceptability



NEW JERSEY BAY AND OCEAN SHORE SEGMENT BOUNDARY 1978
CAFRA AND WETLANDS
Figure 1-7

of activities in riparian lands, as expressed through the issuance of waterfront development permits, depends on the degree to which the proposed action would impair the ability of the public to benefit from these resources, Riparian rights are predicated on the condition that the exercise of these rights does not adversely affect resource values as established in the Public Trust Doctrine.

More detailed information concerning State of New Jersey agencies involved with riparian, wetland, and coastal matters is presented in Vol. II, Chapter 5, Institutional Framework.

The following list provides a brief description of pertinent New Jersey statutes regarding wetlands:

Coastal Area Facility Review Act (CAFRA)

N.J.S.A. 13:19-1 *et seq.*; enacted June 30, 1973 This act provides a list of selected facilities which must be reviewed and approved by NJDEP before they can be constructed within the statutorily defined "coastal area."

Wetlands Act

N J S.A. 13:9A-1 *et seq.*; enacted November 5, 1970. This Act defines "coastal wetlands" and authorizes the regulation of all activities occurring on wetlands.

Riparian Statutes

N.J.S.A. 12:3-1 through 12:3-71; enacted at various dates beginning 1869 These laws define the procedures and standards for leases, grants, and conveyances of riparian lands.

N.J.S.A 12:5-1 through 12:5-11; enacted at various dates beginning 1914. These laws define the procedures and standards for the management of waterfront and harbor facilities, including waterfront development permits.

N.J.S.A. 13:1B-10, 11, 12; enacted at various dates beginning 1948. These laws define the powers, functions, and duties of the Tidelands Resource Council which decides riparian lands management, real estate matters, and reviews certain waterfront development permit applications.

N.J S.A. 13:1B-13; enacted 1948. This law defines the procedure for approval of riparian leases and grants.

EXECUTIVE SUMMARY

Chapter 2
STUDY CONCLUSIONS

2.1 INTRODUCTION

The **Atlantic City Area Wetlands Review** provides a regional approach to the regulation of activities affecting wetlands within the Atlantic City area. It is intended to serve as a guidance document for prospective permit applicants, for agencies participating in the Corps' permit application review process, and for others interested in Federal regulation of wetlands within the study area.

The Study Conclusions Chapter presents a three step ***ACTIVITY ACCEPTABILITY PROCESS***. Use of the process allows one to:

- identify areas within the study area that are under Corps jurisdiction,
- determine the general acceptability of certain activities affecting wetlands, and
- select the least environmentally damaging project design by referring to activity-specific design criteria.

The ***ACTIVITY ACCEPTABILITY PROCESS*** allows an applicant for a corps permit to make a preliminary determination of the general acceptability of his project **prior** to direct involvement with the Corps. Final determination by the Corps of the acceptability of a permit application proposal would be made on a case-by-case, site-by-site basis.

2.2 MAPS

The maps in this study are presented to assist prospective applicants and others in identifying the location of areas under Corps jurisdiction within the study area.

The ***STUDY AREA BASE MAP*** was prepared by interpreting the location of wetlands on New Jersey Department of Environmental Protection color infrared photographs (1:12,000, 1977) and on draft National Wetlands Inventory maps, U.S. Fish and Wildlife Service (1:24,000, 1977). The limits of jurisdiction were then indicated on 1:24,000 U.S. Geological Survey quadrangle maps.

None of the maps presented in this study represent legally delineated wetlands.

The maps presented on the $8^1/_2$ by 17 inch fold-out sheets are of a scale of one inch equals approximately one mile.

Questions regarding the presence or extent of wetlands may be resolved by requesting the Corps to inspect the proposed project site.

2.3 ACTIVITY ACCEPTABILITY PROCESS

The ***ACTIVITY ACCEPTABILITY PROCESS*** is separated into three separate and sequential steps. These steps are summarized below and discussed in detail in the sections which follow:

STEP 1. STUDY AREA CLASSIFICATION

The method of classifying wetland and non-wetland portions of the study area is described, and the classification of these areas is presented.

Wetland areas are designated as either:

- Wetlands of Importance, or
- Wetlands of Concern.

Non-wetland (upland) areas are designated as either:

- Areas of High Density Development, or
- Areas of Low Density Development.

In this document, the use of the word **wetlands** generally refers to all areas under Corps jurisdiction, ie. vegetated wetlands such as saltmarsh and swamps, intertidal areas, and aquatic areas such as the open waters of the ocean and the back bays.

STEP 2. ACTIVITY CLASSIFICATION AND ACCEPTABILITY

Activities occurring in wetlands are identified and defined according to scale. Two scales are presented: one for small scale projects and one for large scale projects.

The acceptability of each activity is indicated in an ***Activity Acceptability Block*** which follows each activity's definition. Three categories of activity acceptability are possible:

- Acceptable Generally (AG),
- Acceptable Generally with Conditions (AC), and
- Unacceptable Generally (UG).

Activity acceptability categories indicate the acceptability of each activity as a result of its anticipated adverse environmental impacts and of its record of permit approval by the Philadelphia District of the Corps.

STEP 3. DESIGN CRITERIA

Recommended design criteria are presented for each activity previously defined.

Figure 2-1 presents the ***ACTIVITY ACCEPTABILITY PROCESS*** in outline form.

2.3.1 STEP 1: STUDY AREA CLASSIFICATION

This section describes the steps involved in classification of the study area (Figure 2-2).

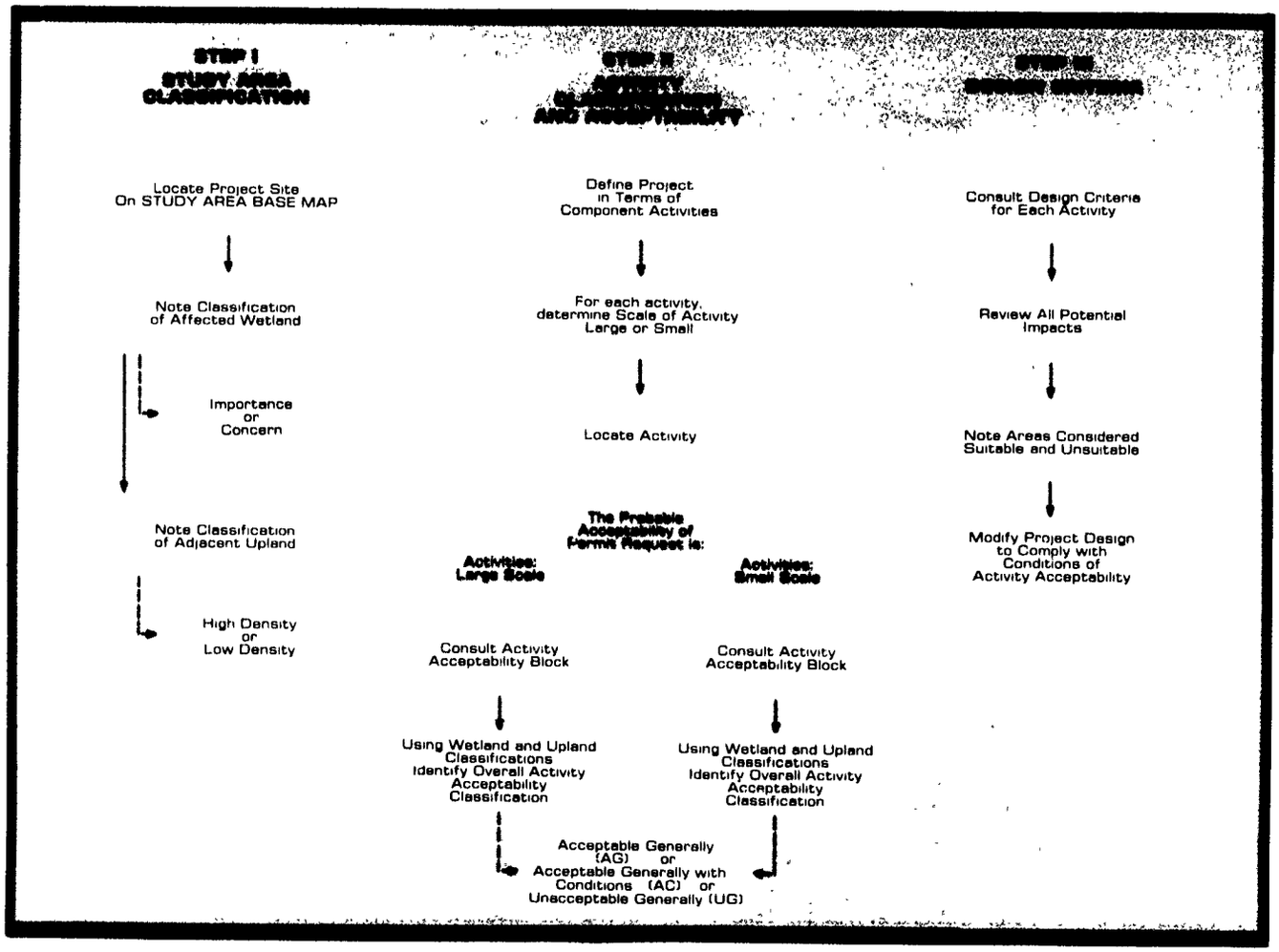
The study area was first divided into a primary study area and a secondary study area. This subdivision was made on the basis of which areas lie within and without jurisdiction of the U.S. Army Corps of Engineers.[1]

The primary and secondary study areas are defined below:

- The primary study area includes all waters and wetlands which are regulated by the Corps.
- The secondary study area includes upland areas which are not regulated by the Corps.

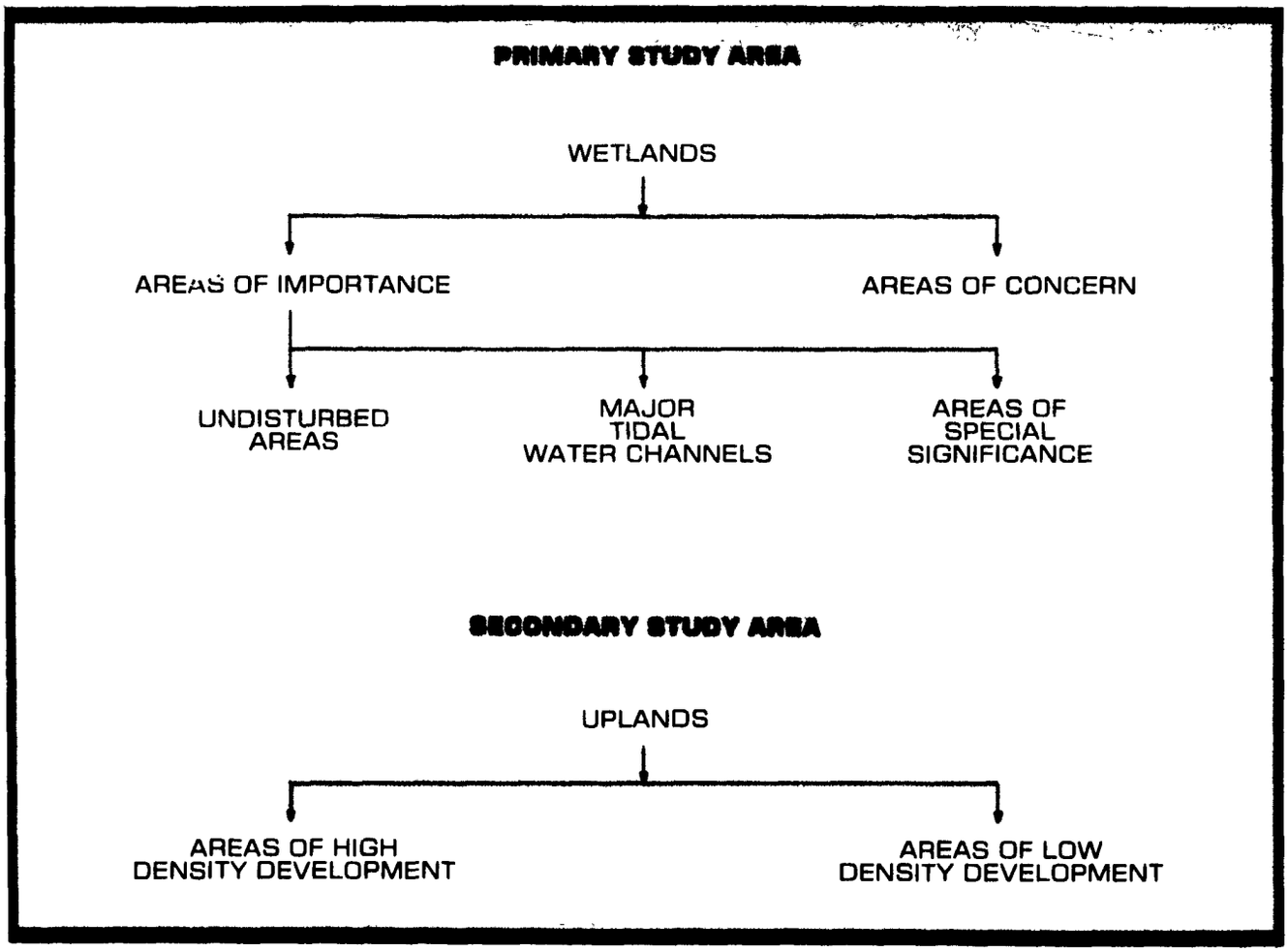
The primary study area, as defined by the Corps' rules and regulations, encompasses four categories:

[1]Certain activities which occur on uplands are also regulated by the Corps if they would impact wetlands adjacent to them. The location and design of dredged material disposal sites is an example of such an activity.



ACTIVITY ACCEPTABILITY PROCESS

Figure 2-1



SCHEMATIC DIAGRAM OF STUDY AREA CLASSIFICATION **Figure 2-2**

- Coastal and inland waters, lakes, rivers, and streams that are navigable waters of the United States[1] including adjacent wetlands;[2]
- Tributaries to navigable waters of the United States including adjacent wetlands;
- Interstate waters and their tributaries including adjacent wetlands; and
- All other waters not identified in Categories 1-3 such as isolated lakes and wetlands, intermittent streams, and other waters that are not part of a tributary system to interstate waters or to navigable waters of the United States, the degradation or destruction of which could affect interstate commerce.

(33 CFR 320 et seq.)

The secondary study area includes nonwetland upland areas outside the primary study area. Although the secondary study area is not an officially designated area of Corps jurisdiction, activities on upland areas may have secondary impacts on wetlands. Among the many factors affected by the density of development in the secondary study area are the quantity and quality of surface runoff, the character of the upland-wetland transition zone, and the capacity of fringe areas to accommodate increased urbanization. For these and other reasons, the secondary study area is classified according to its development characteristics.

2.3.1.1 CLASSIFICATION OF THE PRIMARY STUDY AREA

The primary study area is subdivided into two major areas:

- Wetlands of Importance, and
- Wetlands of Concern.

The distinction between these two wetland areas is based on a systematic evaluation of the presence of key resourse characteristics. Three characteristics are used to distinguish Wetlands of Importance from Wetlands of Concern.

Wetlands are considered to be of importance if they are:

- Undisturbed,
- A Major Tidal Water Channel, or
- An Area of Special Significance.

2.3.1.1.1 UNDISTURBED AREAS

First, a positive environmental value is attached to undisturbed areas. Most undisturbed wetlands are also found to be isolated from human development. Lack of disturbance and isolation are considered to be important because they indicate areas which function in an essentially natural state. All undisturbed wetlands, whether isolated or not, were considered to be of prime biological value. Certain areas which were previously disturbed, but which have recovered and are again biologically productive, are also included in this category. See Figure 2-3.

2.3.1.1.2 MAJOR TIDAL WATER CHANNELS

Second, a positive environmental value is attached to the study area's major tidal water channels. As carriers of tidal water, they are vital to the existence of back bay wetlands. Existing water quality and tidal flushing rates would be maintained by minimizing the constriction of routes of water passage. Designated areas include the Intracoastal Waterway, the three oceanic inlets, and the major thoroughfares between the barrier islands and the mainland. See figure 2-4.

2.3.1.1.3 AREAS OF SPECIAL SIGNIFICANCE

Third, a positive environmental value is given to areas of special environmental significance. These are locations identified as being of specific use or subject to specific hazard. Established bird resting areas, the oceanic inlets, and shellfish beds are the major features within this category. However, areas of concentrated shellfish

[1]Those waters subject to the ebb and flow of the tide shoreward to the mean high water mark, and/or presently used, or used in the past, or susceptible to use to transport interstate or foreign commerce

[2]**Wetlands** are defined as areas inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions Wetlands generally include swamps, marshes, bogs, and similar areas

production are not indicated as concentrated shellfish production is assumed to occur throughout the back bays unless indicated otherwise. See Figure 2-5.

2.3.1.1.4 WETLANDS OF CONCERN

Much of the open waters and wetlands of the primary study area are Wetlands of Importance. The remaining wetlands not included within the zone of importance have been impacted by human development and are considered to be Wetlands of Concern. In some cases, these areas are only marginally related to the larger estuarine system. Artificially created or highly modified lagoons and pockets of wetlands surrounded by developed upland areas are examples. Although the biological value attached to Wetlands of Concern may be less than that attached to Wetlands of Importance, they are nonetheless significant as wetlands and come under the jurisdiction of the Corps. See the ***STUDY AREA BASE MAP.***

2.3.1.2 CLASSIFICATION OF THE SECONDARY STUDY AREA

The secondary study area is subdivided into two major categories:

1) Areas of High Density Development, and

2) Areas of Low Density Development.

The distinction between these two areas is based on an evaluation of the character and spatial organization of land uses. Classification of the secondary study area was accomplished through interpretation of aerial photographs supplemented by field checks at certain locations.

2.3.1.2.1 AREAS OF HIGH DENSITY DEVELOPMENT

Areas of high density development include those areas in which development activities are spatially concentrated. Areas developed for commercial and industrial purposes generally meet this criterion. Most public facilities are also considered to be high density development areas although only certain forms of residential uses are so classified. These include high rise apartments, areas of multifamily housing, and areas of closely spaced single family dwellings.

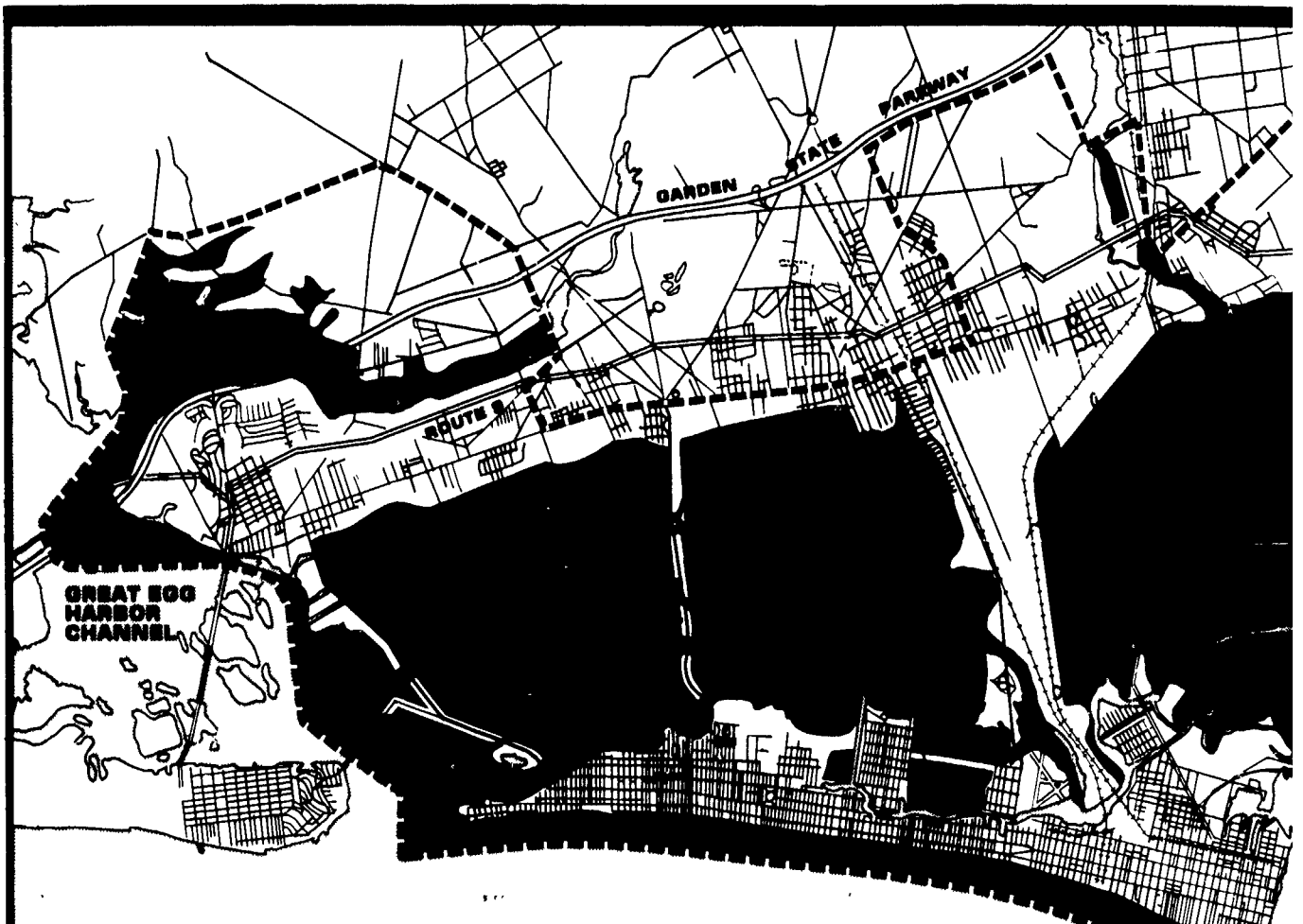
High density development predominates on Absecon Island in the largely urbanized communities of Atlantic City, Ventnor, Margate, and Longport. Concentrated land use patterns are found in parts of Brigantine as well. Relatively dense condiditons are also found in the central sections of suburban communities on the mainland and on the transportation corridors leading from the mainland to the barrier islands. See the ***STUDY AREA BASE MAP.***

2.3.1.2.2 AREAS OF LOW DENSITY DEVELOPMENT

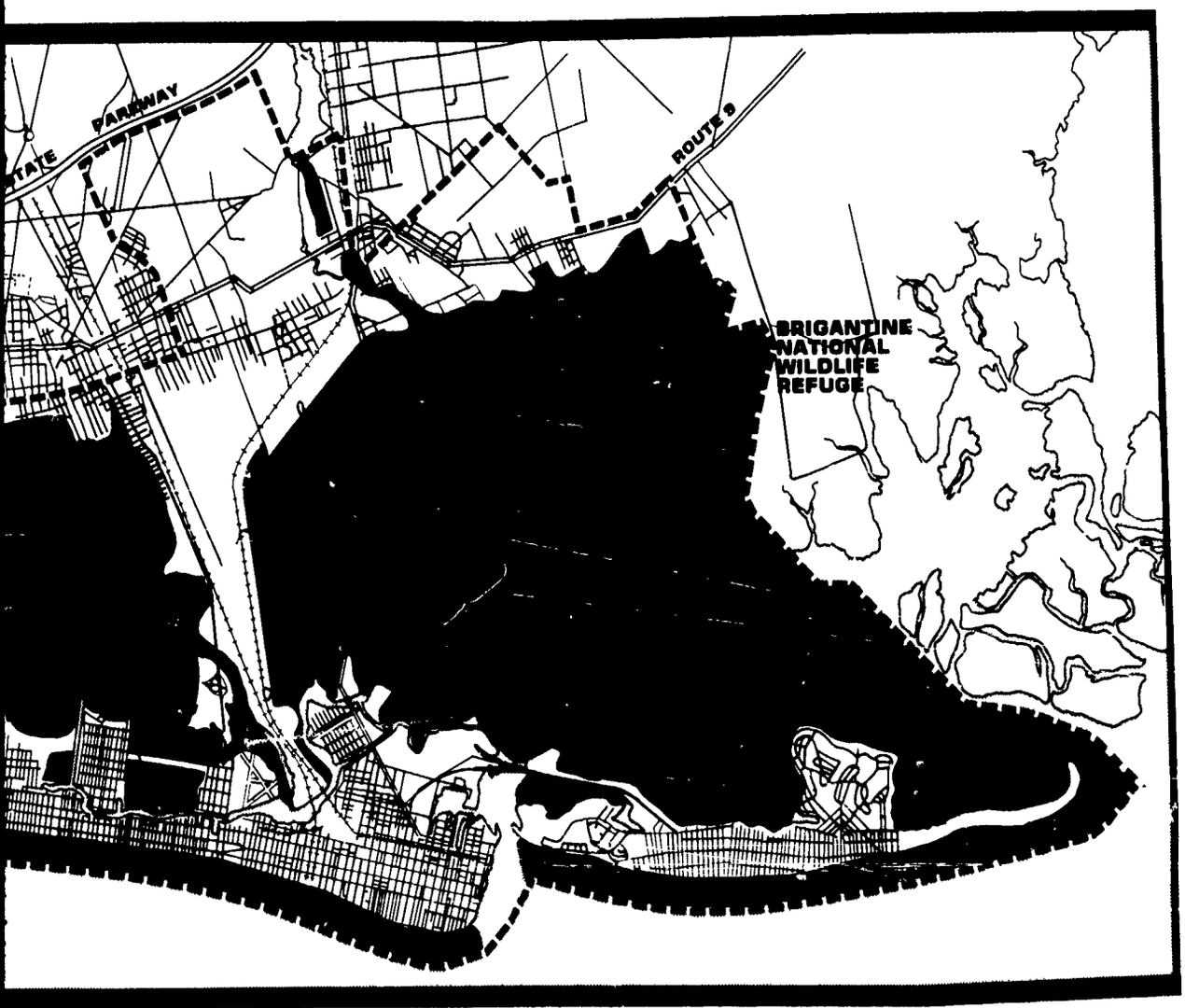
Areas of low density development refer to areas with relatively dispersed patterns of land use. Such areas generally exhibit large amounts of vacant land with development occurring only along roadways. In this study, low density development also includes sparsely settled areas, certain types of public land use, and areas of dispersed single family dwellings. Outlying sections of the mainland communities and the northern end of Brigantine Island are predominantly low density development areas See the ***STUDY AREA BASE MAP.***

2.3.2 STEP 2: ACTIVITY CLASSIFICATION AND ACCEPTABILITY

Analysis of activities proposed in wetlands may be approached in several ways. One method is to consider a project in its entirety and to analyze its complete set of environmental impacts. A second approach is to analyze a project in terms of its individual parts. As an example, the first method would analyze a marina as a whole whereas the second method would separate marina construction into its component activities such as bulkheading, backfilling, constructing boat ramps, placing pilings, and so on For the purposes of the **Review**, projects affecting wetlands are discussed in terms of their individual activities. By using this activity-by-activity approach, the prospective permit applicant can identify, and, if necessary, modify any aspect of a proposed project which the Corps would consider as having unacceptable impacts on wetlands. Once properly designed, the prospect of project approval is enhanced.



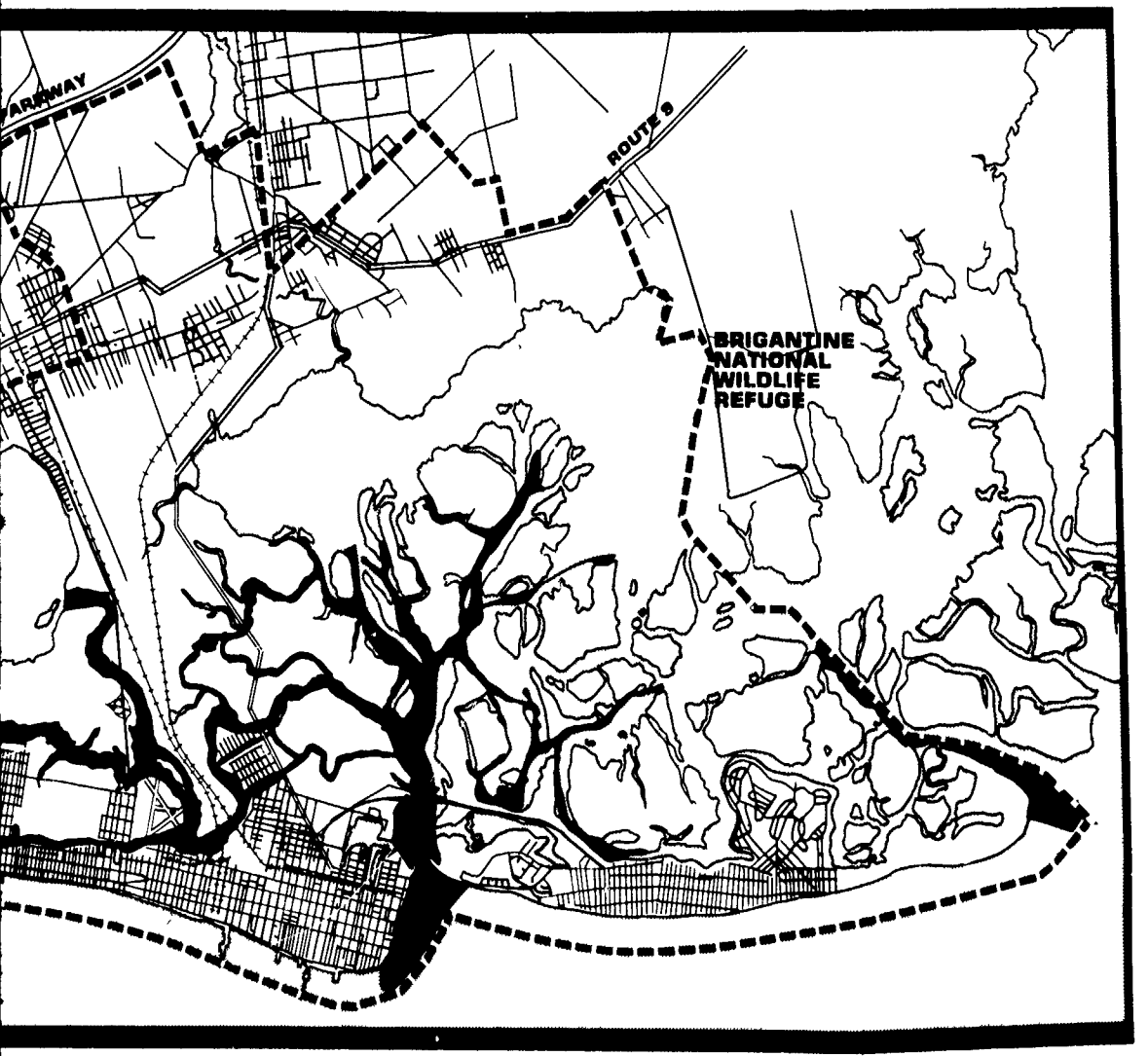
Atlantic City Area Wetlands Review



UNDISTURBED AREAS
PRIMARY AREA CLASSIFICATION

Figure 2-3

Atlantic City Area Wetland Review



MAJOR TIDAL WATER CHANNELS
PRIMARY AREA CLASSIFICATION

2

Figure 2-4

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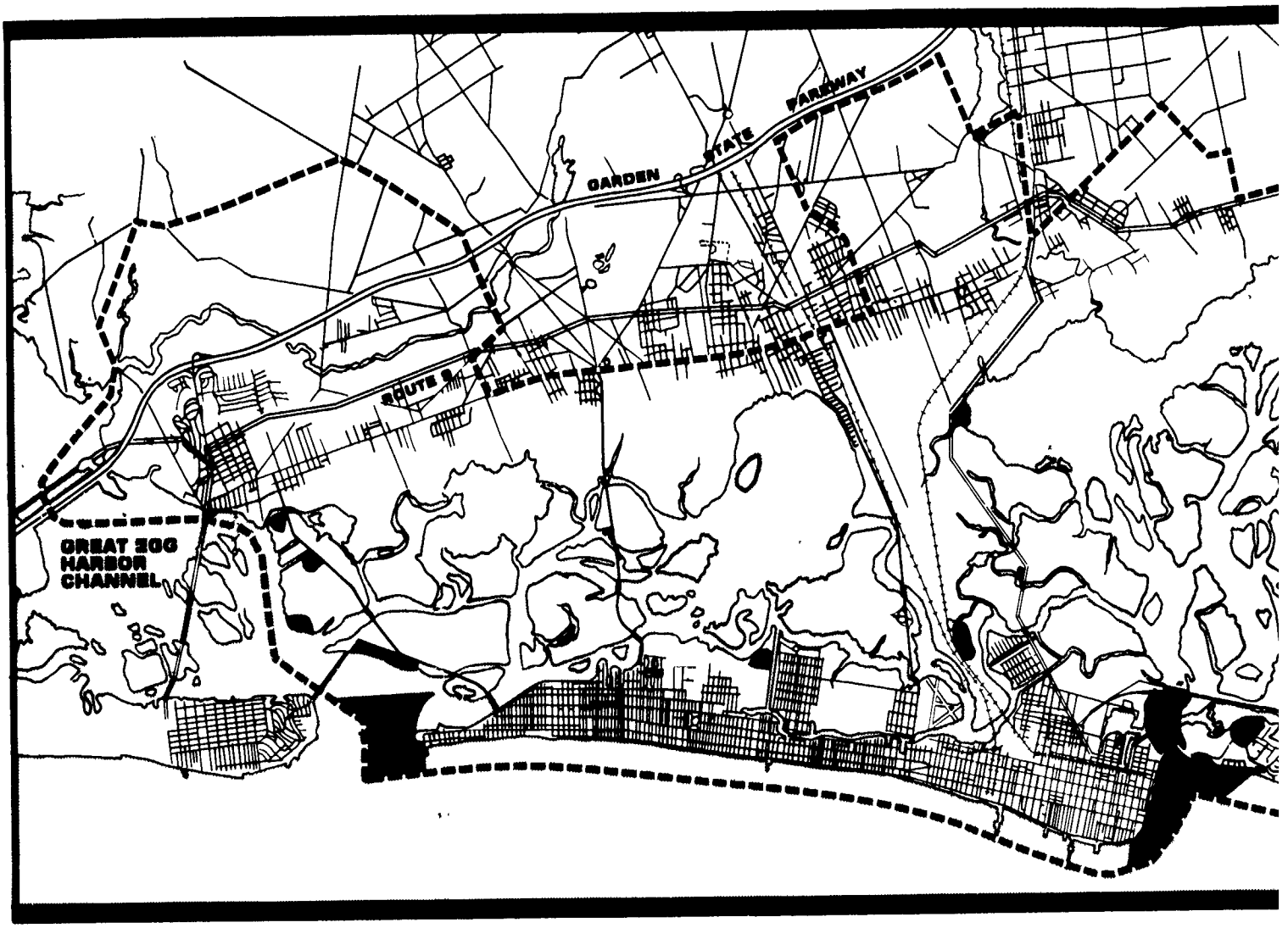
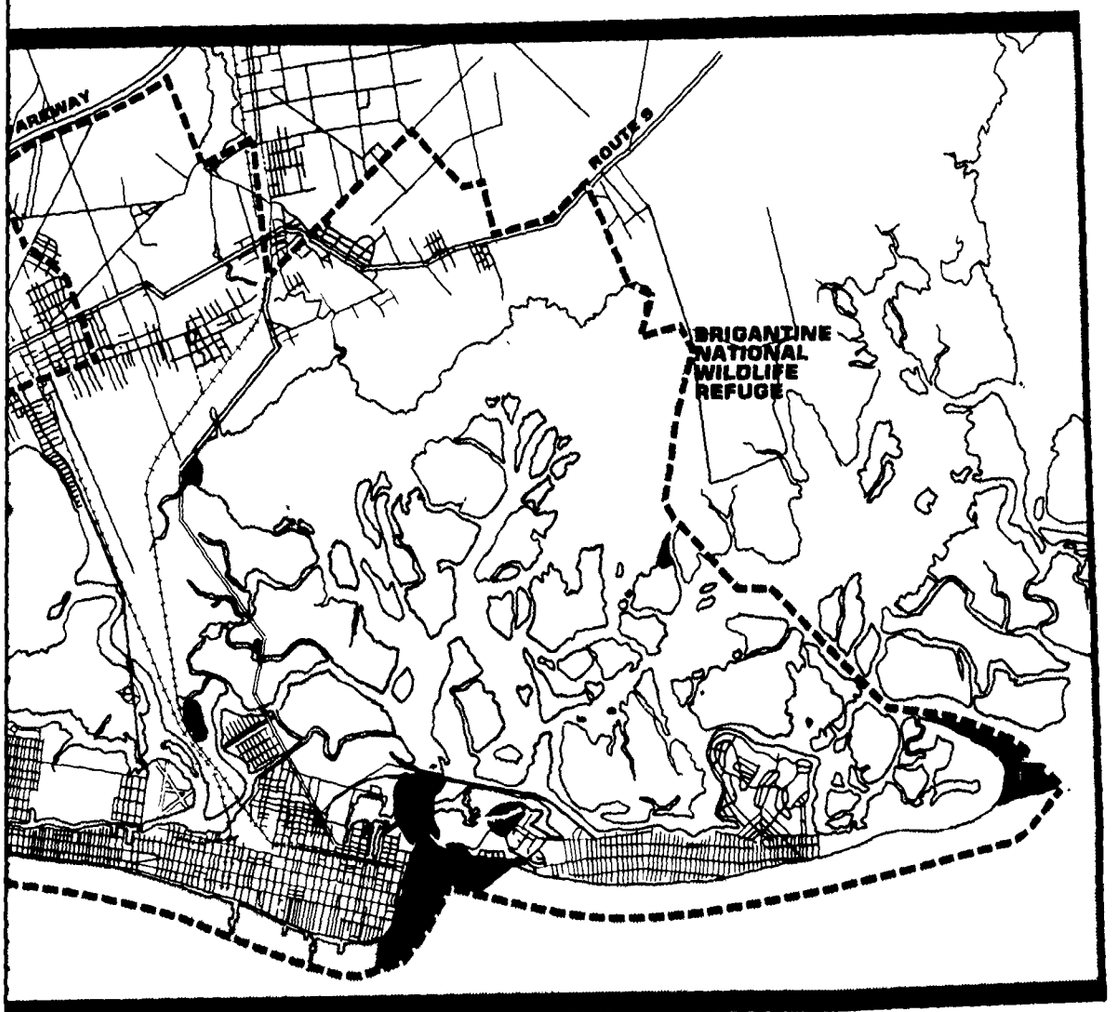


Atlantic City Area Wetlands Review

0 1 2MI
0 1 2 3 4KM

INLETS
ROOKERIES (HERONS, GULLS, TERNS)

ENDANGERED SPECIES
(BLACK SKIMMER, LEAST TERN, OSPREY)



AREAS OF SPECIAL SIGNIFICANCE
PRIMARY AREA CLASSIFICATON

ENDANGERED SPECIES
(BLACK SKIMMER, LEAST TERN, OSPREY)

SOURCES NESTING SITES JOAN GALLI, DIVISION OF FISH GAME, & WILDLIFE, NJDEP 1980
INLETS JMCA

Figure 2-5

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The activities discussed in this section are separated into two broad categories:

- Small Scale Projects, and
- Large Scale Projects.

Each of these categories is defined below:

SMALL SCALE PROJECTS:

The size and complexity of small scale projects are limited in comparison to projects designated "Large Scale". Most small scale projects are sponsored by individuals or families to meet personal or family needs

LARGE SCALE PROJECTS:

Large scale projects are typically sizeable private projects or projects sponsored by a governmental agency, commercial developer, or other non-private entity They are usually for-profit or public works projects.

The activities identified and defined in the discussion of small scale projects include:

Boat ramp;
Breakwater, floating or pile supported;
Bulkhead and backfill;
Dredged material disposal;
Dredging-maintenance;
Dredging-new;
Excavation;
Fill;
Mooring buoy;
Piling; and
Riprap.

The activities identified and defined in the discussion of large scale projects include:

Beach nourishment;
Boat ramp;
Breakwater-floating or pile supported;
Bulkhead and backfill;
Dredged material disposal;
Dredging-maintenance;
Dredging-new;
Excavation;
Fill;
Groin;
Jetty;
Mooring Buoys;
Mosquito control;
Outfall;
Piling-single and cluster;
Pipeline or submerged cable;
Pylon, overhead cable; and
Riprap.

Accompanying the definition of each small and large scale activity is an *Activity Acceptability Block* (Figure 2-6). Within each block is an activity acceptability classification. Each activity acceptability classification is a preliminary designation of the Corps' response to the activity proposed. It does not represent a final decision on the acceptability of permit application, however.

Three separate activity acceptability classifications are possible:

ACCEPTABLE GENERALLY (AG): This is an indication that an activity in the area described would generally receive permit approval. It is assumed that the project would be designed in conformance with the design criteria presented later in this chapter.

ACCEPTABLE GENERALLY WITH CONDITIONS (AC): This classification is used for projects which have potential adverse impacts of significance, but if properly designed, may be permitted.

UNACCEPTABLE GENERALLY (UG): This classification is given to those activities which by their nature and adverse environmental impacts are deemed unacceptable and for which a permit is not customarily granted.

In order to use the *Activity Acceptability Blocks*, the following steps should be taken. Refer to Figure 2-7 to follow the actual selection process. Review of Figure 2-1 may also be of assistance.

2.3.2.1 ACTIVITIES: SMALL SCALE DEFINITION AND ACTIVITY ACCEPTABILITY

2.3.2.1.1 BOAT RAMP

A boat ramp is an inclined plane extending from land into the water. The purpose of a boat ramp is to allow vehicles to launch a boat at a water depth sufficient for it to float.

Activity	1 What is the Classification of the Affected Wetland?	Check One	2 What is the Density of Development of the Adjacent Upland?	Check One	3 Probable Acceptability of the Project
BOATRAMP	IMPORTANCE	☐	HIGH	☐ →	AC
			LOW	☐ →	UG
	CONCERN	☐	HIGH	☐ →	AC
			LOW	☐ →	AC

SAMPLE ACTIVITY DEFINITION AND ACCOMPANYING *ACTIVITY ACCEPTABILITY BLOCK.*

Figure 2-6

Activity Acceptability Blocks should be read from left to right. A decision must be made in vertical columns 1 and 2, and the answer indicated immediately to the right of each column. The activity acceptability classification (AG, AC, or UG) is found in Column 3.

DIRECTIONS:

1 — Having selected the appropriate activity and its scale, select an answer to Question 1, **What is the Classification of the Affected Wetland?** The wetland affected by the proposed activity would be either a **Wetland of Importance** or a **Wetland of Concern**. Make this selection by consulting the ***STUDY AREA BASE MAP.***

In the sample block, a Wetland of Concern has been selected.

2 — For Question 2, **What is the Density of Development of the Adjacent Upland?,** select the appropriate designation of the nearest upland area. Two choices are possible: **High Density Development** or **Low Density Development**. Again, refer to the ***STUDY AREA BASE MAP*** to make this determination.

In the sample block, a high density development area has been selected.

3 — For Item 3, the final column, note the one activity acceptability classification which appears. This column identifies, in a general way, the acceptability of the proposed activity. In the sample block the activity acceptability for BOAT RAMP in a Wetland of Concern adjacent to an upland area of high density development is "AC" or Acceptable Generally with Conditions.

The design criteria recommendations regarding the proposed activity are found in Section 2.3.3, Design Criteria.

Activity	1. What is the Classification of the Affected Wetland?	Check One	2. What is the Density of Development of the Adjacent Upland?	Check One	3. Probable Acceptability of the Project.
BOATRAMP	IMPORTANCE	☐	HIGH	☐ →	AC
			LOW	☐ →	UG
	CONCERN	■	HIGH	■ →	AC
			LOW	☐ →	AC

SAMPLE *ACTIVITY ACCEPTABILITY BLOCK* TAKEN FROM THE LIST OF SMALL SCALE PROJECTS.

Figure 2-7

2.3.2.1 ACTIVITIES: SMALL SCALE

2.3.2.1.1 BOAT RAMP

A boat ramp is an inclined plane extending from land into the water. The purpose of a boat ramp is to allow vehicles to launch a boat at a water depth sufficient for it to float.

Activity	1 What is the Classification of the Affected Wetland?	Check One	2 What is the Density of Development of the Adjacent Upland?	Check One	3 Probable Acceptability of the Project
BOATRAMP	IMPORTANCE	☐	HIGH	☐ →	AC
			LOW	☐ →	UG
	CONCERN	☐	HIGH	☐ →	AC
			LOW	☐ →	AC

2.3.2.1.2 BREAKWATER, FLOATING OR PILE SUPPORTED

A floating or pile supported structure placed in open water, usually parallel to the shore. Typically its purpose is to protect an individual's moorage facilities or waterfront residence. In this study, breakwaters are assumed to occur in the back bays and in the tidal creeks only.

Activity	1 What is the Classification of the Affected Wetland?	Check One	2 What is the Density of Development of the Adjacent Upland?	Check One	3 Probable Acceptability of the Project.
BREAKWATER FLOATING OR PILE SUPPORTED	IMPORTANCE	☐	HIGH	☐ →	AG
			LOW	☐ →	AG
	CONCERN	☐	HIGH	☐ →	AG
			LOW	☐ →	AG

2.3.2.1.3 BULKHEAD AND BACKFILL

A vertical structure, usually constructed parallel to the shoreline. Its purpose is to retain land or protect property against wave or storm damage. In this study, bulkheads are assumed to be backfilled with clean, inorganic material from an upland site.

Activity	1 What is the Classification of the Affected Wetland?	Check One	2 What is the Density of Development of the Adjacent Upland?	Check One	3 Probable Acceptability of the Project
BULKHEAD & BACKFILL	IMPORTANCE	☐	HIGH	☐ →	AC
			LOW	☐ →	UG
	CONCERN	☐	HIGH	☐ →	AC
			LOW	☐ →	AC

2.3.2.1.4 DREDGED MATERIAL DISPOSAL

The discharge of sediment material obtained through dredging. In this study, dredged material disposal for small scale projects is assumed to occur on upland sites only.

NOTE: *There is no Activity Acceptability Block for this activity.*

2.3.2.1.5 DREDGING - MAINTENANCE

The removal of a limited amount of bottom sediment from a previously dredged area in order to maintain a specified water depth, usually at a dock site or within a private access channel.

Activity	1 What is the Classification of the Affected Wetland?	Check One	2 What is the Density of Development of the Adjacent Upland?	Check One	3 Probable Acceptability of the Project
DREDGING MAINTENANCE	IMPORTANCE	☐	HIGH	☐ →	AC
			LOW	☐ →	AC
	CONCERN	☐	HIGH	☐ →	AC
			LOW	☐ →	AC

2.3.2.1.6 DREDGING - NEW

The removal of a limited amount of bottom sediment from a previously undredged area in order to create navigable conditions, usually for an individual dock site or private access channel.

Activity	1 What is the Classification of the Affected Wetland?	Check One	2 What is the Density of Development of the Adjacent Upland?	Check One	3 Probable Acceptability of the Project
DREDGING-NEW	IMPORTANCE	☐	HIGH	☐ →	AC
			LOW	☐ →	UG
	CONCERN	☐	HIGH	☐ →	AC
			LOW	☐ →	AC

2.3.2.1.7 EXCAVATION

The removal of earth from upland areas for the purpose of depressing the elevation of an area below the level of mean high water. In this study, the purpose of excavation is the creation of private boat slips. The creation of boat slips within the study area is generally acceptable with conditions (AC) in those areas lacking a vegetated wetland fringe. In those areas with a vegetated wetland fringe, this activity would be unacceptable generally (UG). In these cases, construction of a pile supported walkway to the mooring site channelward of the wetland fringe would be recommended.

NOTE: *There is no Activity Acceptability Block for this activity.*

2.3.2.1.8 FILL

Fill is the placement of material (other than dredged material) on wetlands to replace a wet soil type or aquatic area with dry land or to change the depth of water body.

Activity	1 What is the Classification of the Affected Wetland?	Check One	2 What is the Density of Development of the Adjacent Upland?	Check One	3 Probable Acceptability of the Project
FILL	IMPORTANCE	☐	HIGH	☐ →	UG
			LOW	☐ →	UG
	CONCERN	☐	HIGH	☐ →	UG
			LOW	☐ →	UG

2.3.2.1.9 MOORING BUOY

A temporary or permanent piling or floating device anchored in open water for the purpose of securing a boat.

Activity	1 What is the Classification of the Affected Wetland?	Check One	2 What is the Density of Development of the Adjacent Upland?	Check One	3 Probable Acceptability of the Project
MOORING BUOY	IMPORTANCE	☐	HIGH	☐ →	AG
			LOW	☐ →	AG
	CONCERN	☐	HIGH	☐ →	AG
			LOW	☐ →	AG

2.3.2.1.10 PILING

The placement of one or more piles or clusters of piles into a substrate. Pilings are generally used as support for the decking of a walkway or dock, or for the mooring of boats.

Activity	1 What is the Classification of the Affected Wetland?	Check One	2 What is the Density of Development of the Adjacent Upland?	Check One	3 Probable Acceptability of the Project
PILING SINGLE OR CLUSTER	IMPORTANCE	☐	HIGH	☐ →	AG
			LOW	☐ →	AG
	CONCERN	☐	HIGH	☐ →	AG
			LOW	☐ →	AG

2.3.2.1.11 RIPRAP

The placement of stone or concrete rubble as bank facing to prevent the erosion, scouring, or sloughing of a structure or embankment.

Activity	1 What is the Classification of the Affected Wetland?	Check One	2 What is the Density of Development of the Adjacent Upland?	Check One	3 Probable Acceptability of the Project
RIPRAP	IMPORTANCE	☐	HIGH	☐ →	AC
			LOW	☐ →	UG
	CONCERN	☐	HIGH	☐ →	AC
			LOW	☐ →	AC

2.3.2.2 ACTIVITIES: LARGE SCALE

2.3.2.2.1 BEACH NOURISHMENT

Beach nourishment is the replenishment of sediment, usually sand, to a beach face above the level of mean high water. In this study, beach nourishment is assumed to occur along oceanfront beaches only.

Activity	1 What is the Classification of the Affected Wetland?	Check One	2. What is the Density of Development of the Adjacent Upland?	Check One	3 Probable Acceptability of the Project
BEACH NOURISHMENT	IMPORTANCE	☐	HIGH	☐ →	AC
			LOW	☐ →	AC
	CONCERN	☐	HIGH	☐ →	AC
			LOW	☐ →	AC

2.3.2.2.2 BOAT RAMP

A boat ramp is an inclined plane extending from the land into the water which allows one or more vehicles to launch one or more boats at a water depth sufficient to float. Multiple boat ramps and commercial facilities are discussed in the Special Study on Mooring Facilities, Section 2-4.

Activity	1 What is the Classification of the Affected Wetland?	Check One	2. What is the Density of Development of the Adjacent Upland?	Check One	3 Probable Acceptability of the Project
BOATRAMP	IMPORTANCE	☐	HIGH	☐ →	AC
			LOW	☐ →	UG
	CONCERN	☐	HIGH	☐ →	AC
			LOW	☐ →	AC

2.3.2.2.3 BREAKWATER - FLOATING OR PILE SUPPORTED

A breakwater is a floating or pile supported structure placed in open water, usually parallel to the shoreline. Its purpose is to protect shore, harbor, or moorage areas from wave or storm damage. In this study, breakwaters are assumed to occur in the back bays and in the tidal creeks only.

Activity	1 What is the Classification of the Affected Wetland?	Check One	2 What is the Density of Development of the Adjacent Upland?	Check One	3 Probable Acceptability of the Project
BREAKWATER FLOATING OR PILE SUPPORTED	IMPORTANCE	☐	HIGH	☐ →	AG
			LOW	☐ →	AG
	CONCERN	☐	HIGH	☐ →	AG
			LOW	☐ →	AG

2.3.2.2.4 BULKHEAD AND BACKFILL

A bulkhead is a vertical structure, usually constructed parallel to the shoreline. Its purpose is to retain land or to protect it against wave or storm damage. In this study, bulkheads are assumed to occur in the back bays and in the tidal creeks only. It is also assumed that they would be backfilled with clean, inorganic material from an upland source.

Activity	1 What is the Classification of the Affected Wetland?	Check One	2 What is the Density of Development of the Adjacent Upland?	Check One	3. Probable Acceptability of the Project
BULKHEAD & BACKFILL	IMPORTANCE	☐	HIGH	☐ →	AC
			LOW	☐ →	UG
	CONCERN	☐	HIGH	☐ →	AC
			LOW	☐ →	AC

2.3.2.2.5 DREDGED MATERIAL DISPOSAL

The disposal of sediment obtained through dredging on wetlands In this study, dredged material disposal is assumed to occur in the back bays and in the tidal creeks only

Activity	1 What is the Classification of the Affected Wetland?	Check One	2 What is the Density of Development of the Adjacent Upland?	Check One	3 Probable Acceptability of the Project
DREDGED MATERIAL DISPOSAL	IMPORTANCE	☐	HIGH	☐ →	UG
			LOW	☐ →	UG
	CONCERN	☐	HIGH	☐ →	UG
			LOW	☐ →	UG

2.3.2.2.6 DREDGING - MAINTENANCE

The removal of bottom sediment from a previously dredged area, usually to maintain the required depth of a navigable waterway or mooring basin.

Activity	1 What is the Classification of the Affected Wetland?	Check One	2 What is the Density of Development of the Adjacent Upland?	Check One	3 Probable Acceptability of the Project
DREDGING MAINTENANCE	IMPORTANCE	☐	HIGH	☐ →	AC
			LOW	☐ →	AC
	CONCERN	☐	HIGH	☐ →	AC
			LOW	☐ →	AC

2.3.2.2.7 DREDGING - NEW

The removal of bottom sediment from a previously undredged area, usually to create navigable conditions sufficient for the passage or moorage of boats. In this study, new dredging is assumed to occur in the back bays and in the tidal creeks only.

Activity	1 What is the Classification of the Affected Wetland?	Check One	2 What is the Density of Development of the Adjacent Upland?	Check One	3 Probable Acceptability of the Project
DREDGING NEW	IMPORTANCE	☐	HIGH	☐ →	UG
			LOW	☐ →	UG
	CONCERN	☐	HIGH	☐ →	AC
			LOW	☐ →	UG

2.3.2.2.8 EXCAVATION

The removal of earth from an upland area for the purpose of depressing the elevation of such area below the mean high water level Three activities are considered likely within this activity type marina construction, dead-end lagoon construction, and creation of wetlands Within the study area, marina construction is generally acceptable with conditions (AC), dead-end lagoon construction is generally unacceptable (UG), and marsh creation is generally acceptable with conditions (AC) See Section 2-4, Mooring Facilities.

NOTE: *There is no Activity Acceptability Block for this activity There is also no presentation of design criteria for this activity.*

2.3.2.2.9 FILL

Fill is the placement of material (other than dredged material) on wetlands to replace a wet soil type or an aquatic area with dry land or to change the depth of a water body.

Activity	1 What is the Classification of the Affected Wetland?	Check One	2 What is the Density of Development of the Adjacent Upland?	Check One	3 Probable Acceptability of the Project
FILL	IMPORTANCE	☐	HIGH	☐ →	UG
			LOW	☐ →	UG
	CONCERN	☐	HIGH	☐ →	UG
			LOW	☐ →	UG

2.3.2.2.10 GROIN

A groin is a shore protection structure designed to trap littoral drift or to retard shore erosion. In this study, groins are assumed to occur only along the oceanfront.

Activity	1 What is the Classification of the Affected Wetland?	Check One	2 What is the Density of Development of the Adjacent Upland?	Check One	3 Probable Acceptability of the Project
GROIN	IMPORTANCE		HIGH	☐ →	AC
			LOW	☐ →	UG

2.3.2.2.11 JETTY

A jetty is a structure that extends into a body of water above the water's surface. Its purpose is to prevent shoaling by altering stream or tidal flow. In this study, jetties are assumed to occur in association with oceanic inlets.

Activity	1 What is the Classification of the Affected Wetland?	Check One	2 What is the Density of Development of the Adjacent Upland?	Check One	3 Probable Acceptability of the Project
JETTY	IMPORTANCE		HIGH	☐ →	AC
			LOW	☐ →	UG

2.3.2.2.12 MOORING BUOYS

Mooring bouys are a cluster of temporary or permanent pilings or floating devices anchored in open water to secure boats in lieu of conventional land based mooring facilities.

Activity	1 What is the Classification of the Affected Wetland?	Check One	2 What is the Density of Development of the Adjacent Upland?	Check One	3 Probable Acceptability of the Project
MOORING BUOYS	IMPORTANCE	☐	HIGH	☐ →	AG
			LOW	☐ →	AG
	CONCERN	☐	HIGH	☐ →	AG
			LOW	☐ →	AG

2.3.2.2.13 MOSQUITO CONTROL

Mosquito control is the alteration of mosquito breeding habitat by means of Open Marsh Water Management. Open Marsh Water Management employs the use of tidal ditches, ponds, and pond radials to minimize larval hatching.

NOTE: *The objective of ditching is to enhance the exchange of tidal water in mosquito breeding areas of the marsh. The objective of ponding and the construction of pond radials is to provide a semi-permanent body of water designed to support populations of insectivorous fish. Open Marsh Water Management is a more effective and less disruptive approach to the problems of mosquito control than random parallel ditching or the application of persistent pesticides. The combination of ponds and ditches to be used on any particular marsh site depends upon the characteristics of the marsh: the location of breeding depressions, the presence of naturally occuring or previously constructed ditches or ponds, and the size of the area to be managed.*

Activity	1 What is the Classification of the Affected Wetland?	Check One	2 What is the Density of Development of the Adjacent Upland?	Check One	3. Probable Acceptability of the Project.
MOSQUITO CONTROL	IMPORTANCE	☐	HIGH	☐ →	AC
			LOW	☐ →	AC
	CONCERN	☐	HIGH	☐ →	AC
			LOW	☐ →	AC

2.3.2.2.14 OUTFALL

An outfall is a tubular struture located in water areas for the purpose of discharging effluent. There are five main types of outfall: sanitary outfalls which carry effluent from wastewater treatment plants; stormwater outfalls which carry rainwater runoff; combined sewage outfalls which carry both sanitary and rainwater runoff; industrial outfalls which usually carry industrial waste; and thermal outfalls which discharge heated water.

NOTE: *Under the regional wastewater management system currently serving the greater Atlantic City area, all sanitary sewage effluent generated within the study area is treated and discharged into the ocean.*

Activity	1 What is the Classification of the Affected Wetland?	Check One	2 What is the Density of Development of the Adjacent Upland?	Check One	3 Probable Acceptability of the Project
OUTFALL	IMPORTANCE	☐	HIGH	☐ →	AC
			LOW	☐ →	AC
	CONCERN	☐	HIGH	☐ →	AC
			LOW	☐ →	AC

2.3.2.2.15 PILING - SINGLE OR CLUSTER

A piling(s) is one or more piles or clusters of piles placed in a substrate. Pilings are generally used as support for the decking of a walkway or dock, or for the mooring of boats.

Activity	1 What is the Classification of the Affected Wetland?	Check One	2 What is the Density of Development of the Adjacent Upland?	Check One	3 Probable Acceptability of the Project.
PILING- SINGLE OR CLUSTER	IMPORTANCE	☐	HIGH	☐ →	AG
			LOW	☐ →	AG
	CONCERN	☐	HIGH	☐ →	AG
			LOW	☐ →	AG

2.3.2.2.16 PIPELINE OR SUBMERGED CABLE

A pipeline or submerged cable is defined as the linear route and lateral corridor along and within which a pipe or cable is laid or buried.

Activity	1 What is the Classification of the Affected Wetland?	Check One	2 What is the Density of Development of the Adjacent Upland?	Check One	3 Probable Acceptability of the Project
PIPELINE OR SUBMERGED CABLE	IMPORTANCE	☐	HIGH	☐ →	AC
			LOW	☐ →	AC
	CONCERN	☐	HIGH	☐ →	AC
			LOW	☐ →	AC

2.3.2.2.17 PYLON, OVERHEAD CABLE

A pylon is a structure used to support overhead cables. In this study, comments concerning pylons emphasize impacts regarding their location and installation.

Activity	1 What is the Classification of the Affected Wetland?	Check One	2 What is the Density of Development of the Adjacent Upland?	Check One	3 Probable Acceptability of the Project
PYLON OVERHEAD CABLE	IMPORTANCE	☐	HIGH	☐ →	AC
			LOW	☐ →	AC
	CONCERN	☐	HIGH	☐ →	AC
			LOW	☐ →	AC

2.3.2.2.18 RIPRAP

Riprap is the use of stone or concrete rubble as bank facing to prevent the erosion, scouring, or sloughing of a structure or embankment.

Activity	1 What is the Classification of the Affected Wetland?	Check One	2 What is the Density of Development of the Adjacent Upland?	Check One	3 Probable Acceptability of the Project
RIPRAP	IMPORTANCE	☐	HIGH	☐ →	AC
			LOW	☐ →	UG
	CONCERN	☐	HIGH	☐ →	AC
			LOW	☐ →	AC

NOTE: *Certain combinations of activities are proposed more often than others. Perhaps the most common type of project is the moorage facility. Moorage facilities range in type and scale from single boat docks, to multiple slip piers, to large marina complexes. Detailed discussion of mooring facilities, marinas particularly, is presented in Section 2.4, Mooring Facilities.*

Questions regarding activites that are not listed above may be answered by contacting the Philadelphia District of the Corps.

Figure 2-8, "An Applicant's Checklist of General Considerations Relating to the Acceptability of Project Proposals," further assists the applicant in assessing the acceptability of his proposed project

DIRECTIONS: For each of the 17 statements, check the column which best describes the project. Ideally, no checks should appear in the "YES" column. Should there be a "YES" response, however, this may indicate a potential conflict between the proposed project and the Corps' guidelines for project approval.

All of the below concerns are identified in the Corps' Regulations, 33 CFR 320 *et seq.*

	YES	NO
1. Alternative project sites are available.	☐	☐
2. Less environmentally disruptive methods to accomplish the work are available.	☐	☐
3. The extent and permanence of the beneficial effects of the project are small.	☐	☐
4. The extent and permanence of the detrimental effects of the project are great.	☐	☐
5. The project has significant cumulative impacts.	☐	☐
6. The project is not water dependent.	☐	☐
7. The project causes direct and indirect loss of wildlife resources.	☐	☐
8. The project adversely affects water quality.	☐	☐
9. The project impacts historic, scenic or recreational values.	☐	☐
10. The project damages nearby properties.	☐	☐
11. The project interferes with navigation.	☐	☐
12. The project does not comply with New Jersey's Coastal Zone Program.	☐	☐
13. The project endangers the critical habitat of, or destroys, a Federally designated endangered or threatened species.	☐	☐
14. Fill would not be maintained to prevent eroision and other non-point sources of pollution.	☐	☐
15. Project discharge is located in the proximity of a public water supply intake.	☐	☐
16. The project occurs in an area of concentrated shellfish production.	☐	☐
17. The project disrupts the movement of aquatic species.	☐	☐

APPLICANT'S CHECKLIST **Figure 2-8**
OF GENERAL CONSIDERATIONS RELATING TO THE ACCEPTABILITY OF PROPOSED PROJECTS

2.3.3 STEP 3: DESIGN CRITERIA

The Design Criteria Section presents guidelines to be followed in project siting and design.

More specifically, this section provides:

- A review of the anticipated environmental impacts of the activities identified in Section 2.3.2.2, Activities: Large Scale[1];
- Identification of areas considered suitable and unsuitable for the activities identified above; and
- A discussion of conditions which would minimize the adverse environmental impacts of each activity and thereby improve potential project acceptance.

Activity definitions are the same as those found in the list of large scale activities. Generally, the comments and conditions presented in this section relate to the impacts of larger scale projects. They relate to smaller projects inasmuch as they would have environmental impacts similar to larger scale proposals.

Discussion of each activity occurs in the following sequence:

- Potential Impacts,
- Suitable Areas,
- Conditions of Activity Acceptability, and
- Unsuitable Areas.

Two sets of terms are used to classify the potential environmental impacts of each activity. First, the nature of the impact is evaluated and a determination made whether it is favorable or adverse. *Favorable impacts* have a positive, or beneficial, effect on the functioning of the wetland ecosystem. *Adverse impacts* have a negative, or detrimental, effect on the functioning of the wetland ecosystem. Second, the duration of the impact is examined and evaluated as to whether it would be "short term" or "long term." *Short term impacts* are temporary and generally correspond to construction-related disturbances. *Long term impacts* are not limited to an identifiable time period, but continue indefinitely into the future.

A total of four impact classifications is possible:

- Favorable - Short Term,
- Favorable - Long term,
- Adverse - Short Term, and
- Adverse - Long Term.

In those cases where an impact classification is not present, there were no impacts considered to have a significant effect on the natural environment.

[1]No discussion of design criteria for excavation is presented

2.3.3.1 BEACH NOURISHMENT

2.3.3.1.1 POTENTIAL ENVIRONMENTAL IMPACTS

The following environmental impacts may be associated with beach nourishment:

FAVORABLE — SHORT TERM

- Increase the size of the beach area and intertidal zone. (If successful, this could also be a Favorable — Long Term impact.)

ADVERSE — SHORT TERM

- Displace organisms inhabiting beach, intertidal, and shallow water areas.

2.3.3.1.2 SUITABLE AREAS

Beach nourishment is generally acceptable with conditions for beaches adjacent to areas of high density development.

2.3.3.1.3 CONDITIONS OF ACTIVITY ACCEPTABILITY

- Use of clean, inorganic material of a grain size similar to the existing beach sediment.

2.3.3.1.4 UNSUITABLE AREAS

Beach nourishment would not be generally acceptable for beaches adjacent to low density development. The undeveloped northern end of Brigantine Island is the only area within the study area that falls within this category. See Figure 2-9.

2.3.3.2 BOAT RAMP

2.3.3.2.1 POTENTIAL ENVIRONMENTAL IMPACTS

The following environmental impacts may be associated with boat ramps:

FAVORABLE — LONG TERM

- Increase habitat diversity by the introduction of surfaces suitable for colonization by the marine hard bottom community.

BEACH NOURISHMENT **Figure 2-9**

ADVERSE — SHORT TERM

- Temporarily disturb bottom sediment, increase turbidity, and alter benthic habitat during construction.

ADVERSE — LONG TERM

- Eliminate wetlands at the water's edge,
- Require localized dredging at the foot of the ramp,
- Create secondary impacts due to the construction of parking lots and turnaround sites for users of the ramp and for maintenance dredging of the launch site, and
- Increase hydrocarbon pollution, noise, and bottom disturbance by increasing boat traffic.

2.3.3.2.2 SUITABLE AREAS

- Commercial ramps should be located on upland areas with adequate upland road access, parking space, and ancillary services. The project site should front on a navigable waterway. Private ramps should also be located on the edge of upland areas which front on a navigable waterway.

2.3.3.2.3 CONDITIONS OF ACTIVITY ACCEPTABILITY

- Avoid filling wetlands for upland support facilities such as parking lots or other marina support services,
- Avoid single use facilities where possible, and
- Avoid use of heavy equipment on wetlands. Where such use is unavoidable, mats should be placed under equipment to minimize wetland disturbance.

2.3.3.2.4 UNSUITABLE AREAS

Areas generally considered unsuitable for boat ramps include:

- Areas near rookery sites,
- Undisturbed wetland areas,
- Areas which front on unnavigable waters (less than 3' MLW), and
- Areas which require extensive dredging.

2.3.3.3 BREAKWATER - FLOATING OR PILE SUPPORTED

2.3.3.3.1 POTENTIAL ENVIRONMENTAL IMPACTS

The following environmental impacts may be associated with breakwaters:

FAVORABLE — LONG TERM

- Provide hard substrate for organisms which attach themselves or are attracted to such structures. Fish, algae, barnacles, and mussels are examples.

ADVERSE — SHORT TERM

- Temporarily disturb bottom sediment, increase turbidity, and alter benthic habitat duting construction.

ADVERSE — LONG TERM

- Change sediment composition and sedimentation rates in nearby areas by altering patterns of water flow. This may cause shifts in species diversity, distribution, and abundance.

2.3.3.3.2 SUITABLE AREAS

Breakwaters are generally acceptable in the back bays and tidal creeks.

2.3.3.3.3 CONDITION OF ACTIVITY ACCEPTABILITY

- Pile supported breakwaters shall have at least 18 inches of clearance at the bottom and at least 3 inch spacing between vertical sheathing.

2.3.3.3.4 UNSUITABLE AREAS

Placement of a breakwater in a location which would interfere with navigation would be unsuitable. See Figure 2-10.

2.3.3.4 BULKHEAD AND BACKFILL

2.3.3.4.1 POTENTIAL ENVIRONMENTAL IMPACTS

The following environmental impacts may be associated with bulkheads and backfill:

ADVERSE — SHORT TERM

- Temporarily disturb bottom sediment, increase turbidity, and alter benthic habitat during construction.

ADVERSE — LONG TERM

- Involve the filling of wetlands behind the bulkhead;
- Eliminate part of the marsh-upland transition zone including water and intertidal areas;
- Obstruct diamondback terrapins from reaching upland nesting sites; and
- Increase shoreline erosion of unstabilized areas adjacent to the bulkhead.

2.3.3.4.2 SUITABLE AREAS

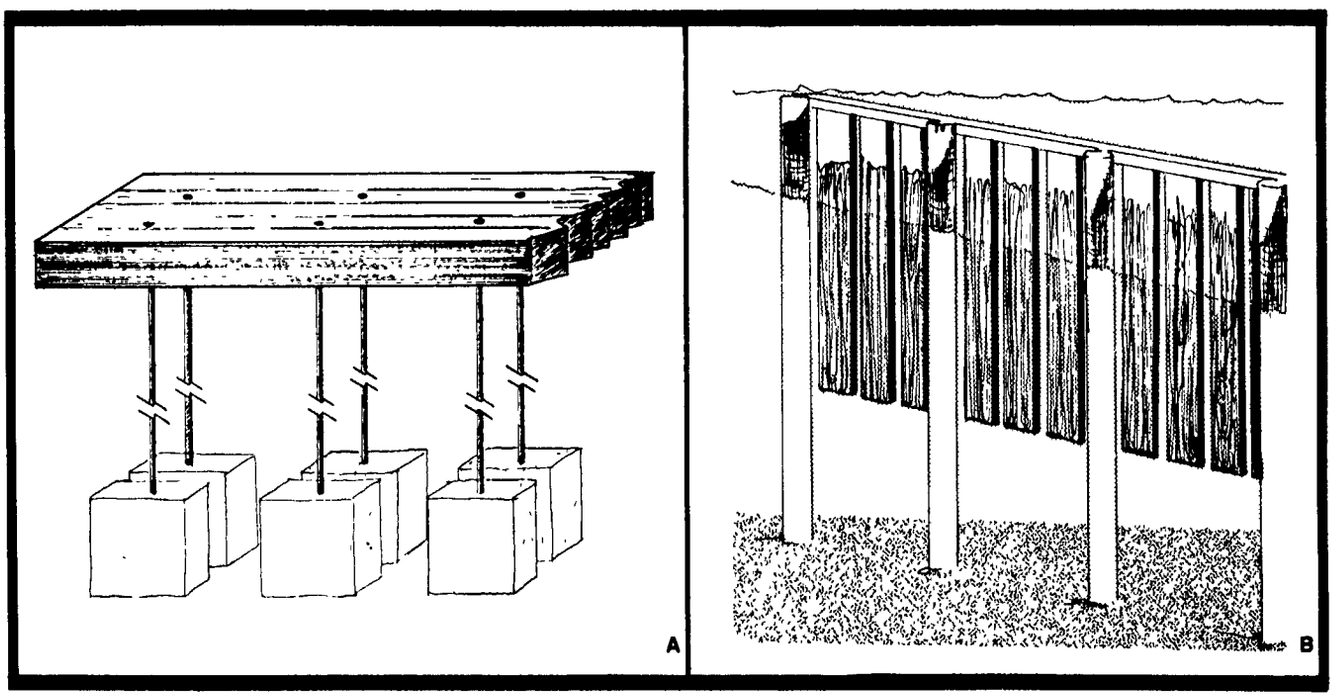
Bulkheads are generally allowed in developed areas with steep or undercut banks where alternative forms of shore protection are either not feasible or ineffective.

2.3.3.4.3 CONDITIONS OF ACTIVITY ACCEPTABILITY

- Bulkheads should not be located channelward of the wetland-upland edge,
- Bulkheading should only be considered when riprap or vegetative shore protection methods are not feasible, and
- Material to backfill bulkheads should not be dredged from aquatic areas (except as the by-product of a dredging project) or from wetlands.

2.3.3.4.4 UNSUITABLE AREAS

Bulkheads are not a preferred method of shoreline protection. They should not be constructed in any area where an alternative method of shoreline protection such as the use of riprap, gabion, or vegetative planting would be appropriate. See Figures 2-11 and 2-12.



BREAKWATERS: FLOATING (A) AND PILE SUPPORTED (B) **Figure 2-10**

2.3.3.5 DREDGED MATERIAL DISPOSAL

2.3.3.5.1 POTENTIAL ENVIRONMENTAL IMPACTS

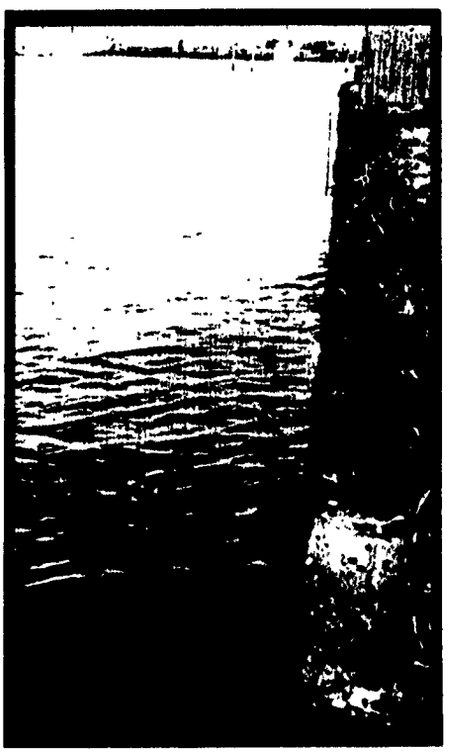
The following environmental impacts may be associated with dredged material disposal:

ADVERSE — SHORT TERM

- Lowers local primary productivity due to increased turbidity,
- Resuspends pollutants where present,
- Degrades water quality by disturbing or resuspending bottom sediment,
- Disrupts fish migration and shellfish spawning, and
- Smothers local clam beds and other benthic animals by the settling of sediment in areas near the project site.

ADVERSE — LONG TERM

- Results in the alteration or loss of habitat, and
- Results in the possible pollution of surface water.



TYPICAL BULKHEAD Figure 2-11

2.3.3.5.2 SUITABLE AREAS

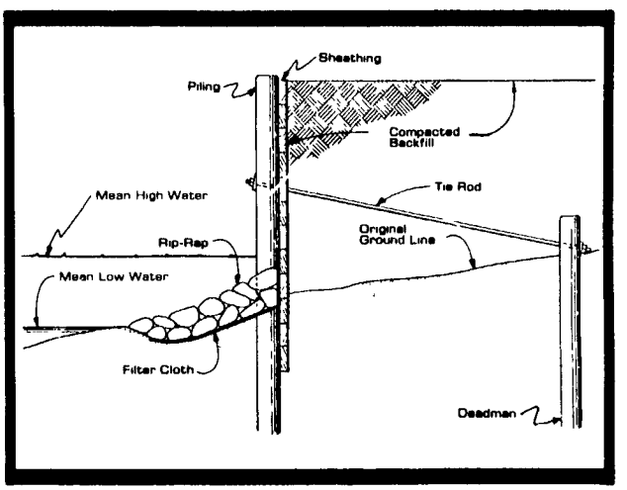
- Previously used non-diked disposal areas on marsh which have not revegetated with plant species typically adapted to saturated soil conditions.
- Previously used diked disposal areas.

2.3.3.5.3 CONDITIONS OF ACTIVITY ACCEPTABILITY

- The disposal area is capable of containing the proposed amount of dredged material.

2.3.3.5.4 UNSUITABLE SITES

All marshes, swamps, tidal flats, and open water areas not fulfilling the above criteria are generally considered unsuitable as sites for dredged material disposal. At this time, overboard disposal of dredged material is generally unacceptable within the study area.



BULKHEAD CONSTRUCTION DETAILS **Figure 2-12**
(Riprap and Filter Cloth are optional).

2.3.3.6 DREDGING—MAINTENANCE

2.3.3.6.1 POTENTIAL ENVIRONMENTAL IMPACTS

The following environmental impacts may be associated with maintenance dredging:

ADVERSE — SHORT TERM

- Removes aquatic organisms inhabiting the area to be dredged,
- Lowers local primary productivity due to increased turbidity,
- Resuspends pollutants where present,
- Degrades water quality by disturbing or resuspending bottom sediment,
- Disrupts fish migration and shellfish spawning, and
- Smothers local clam beds and other benthic animals by the settling of sediment in areas near the project site.

ADVERSE — LONG TERM

- Continues the need for maintenance dredging and for dredged material disposal, and
- Encourages secondary development along the maintained waterway.

2.3.3.6.2 SUITABLE AREAS

Maintenance dredging within the study area is generally acceptable with conditions.

2.3.3.6.3 CONDITIONS OF ACTIVITY ACCEPTABILITY

- Dredging should coincide with periods which cause the least disruption to boat navigation and to aquatic life.

2.3.3.7 DREDGING — NEW

2.3.3.7.1 POTENTIAL ENVIRONMENTAL IMPACTS

The following environmental impacts may be associated with new dredging:

ADVERSE — SHORT TERM

- Removes aquatic organisms inhabiting the area to be dredged,
- Lowers local primary productivity due to increased turbidity,
- Resuspends pollutants where present,
- Degrades water quality by disturbing or resuspending bottom sediment,
- Disrupts fish migration and shellfish spawning, and
- Smothers local clam beds and other benthic animals by the settling of sediment in areas near the project site.

ADVERSE — LONG TERM

- Creates the need for maintenance dredging and for dredged material disposal,
- Induces secondary development along newly created navigable waterways, and
- Increases boating activity and secondary environmental impacts of same in newly created navigable waterways and mooring facilities.

2.3.3.7.2 SUITABLE AREAS

The acceptability of new dredging is dependent upon a range of factors. Among the environmental characteristics and project impacts assessed by the Corps in its case-by-case review of permit applications are:

- Project purpose,
- Benefits to the public,
- Depth and width of adjacent waterways,
- Chemical and physical characteristics of the sediments,
- Presence of aquatic or marsh vegetation,
- Presence of bottom dwelling organisms,
- Dredging methods and timing,
- Turbidity controls,

- Tidal flushing characteristics,
- Water circulation patterns,
- Effects on adjacent marsh and nearshore shallows,
- Need for maintenance dredging,
- Location of temporary and/or permanent dredged material disposal sites, and
- Effects on water quality.

New dredging is generally acceptable with conditions in Wetlands of Concern for the creation of marinas, access channels, or multiple mooring facilities. New dredging would be generally unacceptable in areas with water depths significantly less than those proposed or in areas of vegetated wetlands. The construction of pile supported structures such as walkways would be encouraged in these situations.

2.3.3.7.3 CONDITIONS OF ACTIVITY ACCEPTABILITY

- Dredging should coincide with periods which would cause the least disruption to boat navigation and to aquatic life,
- It is generally unacceptable to dredge wetlands as a means of providing a source of fill material, and
- The depth of dredging should be no greater than the depth of the adjacent natural waterway.

2.3.3.7.4 UNSUITABLE AREAS

New dredging is generally unacceptable in areas lacking dredged material disposal sites for the initial as well as maintenance dredging requirements of the project. Dredging is also discouraged where its occurrence would diminish an area's degree of isolation, impair rates or patterns of tidal circulation, or disturb established rookery sites or shellfish beds. See Figures 2-13 and 2-14.

2.3.3.8 FILL

2.3.3.8.1 POTENTIAL ENVIRONMENTAL IMPACTS

The following environmental impacts may be associated with fill:

ADVERSE — SHORT TERM

- Increases water turbidity during placement of the fill material,
- Displaces bottom dwelling organisms in areas adjacent to the area being filled,
- Lowers local primary productivity due to increased turbidity,
- Degrades water quality by resuspending sediment and/or pollutants, and
- Disrupts fish migration and shellfish spawning.

ADVERSE — LONG TERM

- Buries the affected area,
- Results in the alteration or loss of habitat,
- Alters water circulation, and
- Degrades local water quality by the leaching of organic or inorganic materials.

HYDRAULIC DREDGING **Figure 2-13**

MECHANICAL DREDGING **Figure 2-14**

2.3.3.8.2 SUITABLE AREAS

Generally, there are no suitable areas for this activity.

2.3.3.8.3 CONDITIONS OF ACTIVITY ACCEPTABILITY

- Generally, the filling of wetlands would only be allowed for projects which are in the public interest, which have no alternative sites or designs, and which are water dependent;
- For projects which are in the public interest, for which there are no alternative sites or designs, and which have unavoidable adverse environmental impacts, wetland creation may be a means to compensate wetland loss;
- Fill should be clean inorganic material from an upland source; and
- The placement of fill material should not restrict water flow into or out of any aquatic area.

2.3.3.9 GROIN

2.3.3.9.1 POTENTIAL ENVIRONMENTAL IMPACTS

The following environmental impacts may be associated with groins:

FAVORABLE — LONG TERM

- Provide hard substrate for the attachment of algae and other organisms, and
- If properly designed, assist shoreline stabilization within the immediate area.

ADVERSE — SHORT TERM

- Increase turbidity during construction, and
- Smother bottom dwelling organisms in the area of and adjacent to the structure during construction.

ADVERSE — LONG TERM

- Aggravate down-current beach erosion, and
- Bury intertidal and shallow water habitat.

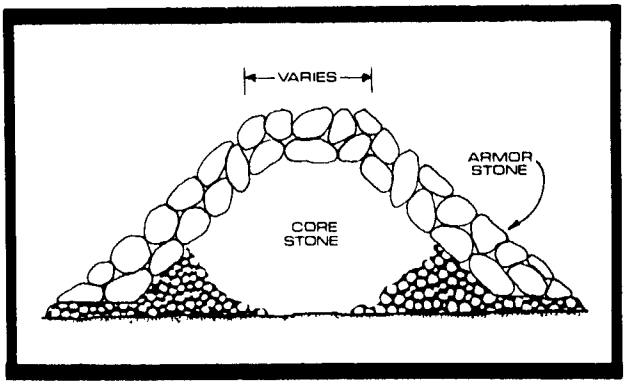
2.3.3.9.2 SUITABLE AREAS

Suitable areas include those locations along the oceanfront where shore erosion is of concern. Figure 2-16 is a photograph showing groins located along Brigantine Island.

2.3.3.9.3 CONDITIONS OF ACTIVITY ACCEPTABILITY

- Groins should not interfere with navigation,
- Groins should allow the down-current passage of silt and sand, and
- Groins should be designed to conform to the profile of the beach.

See Figures 2-15 and 2-16.



CROSS SECTIONAL VIEW OF A RUBBLE MOUND GROIN **Figure 2-15**

2.3.3.10 JETTY

2.3.3.10.1 POTENTIAL ENVIRONMENTAL IMPACTS

The following environmental impacts may be associated with jetties:

FAVORABLE — LONG TERM

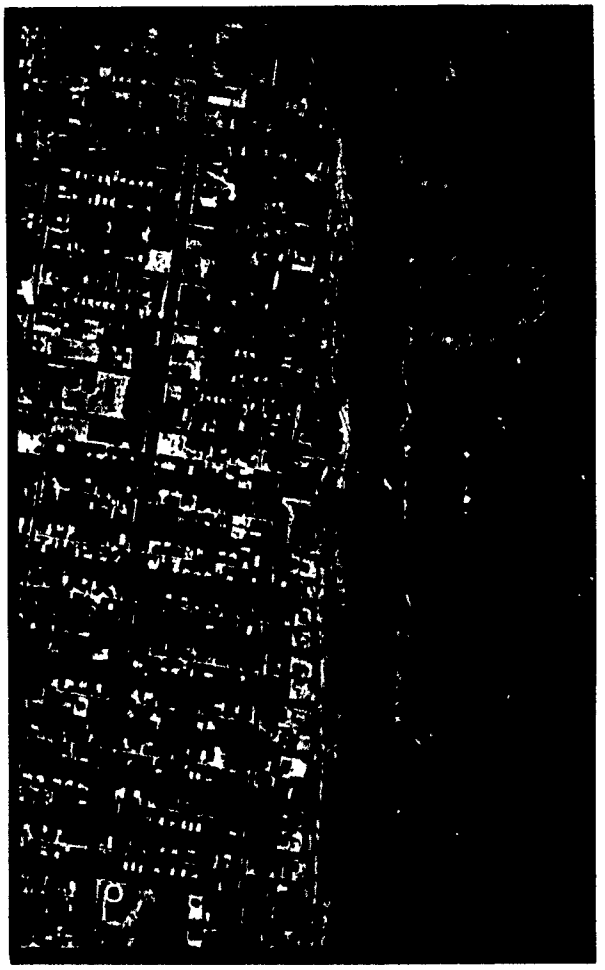
- Provide a substrate for the attachment of algae and other organisms.

ADVERSE — SHORT TERM

- Increase turbidity of local waters during construction.
- Smother bottom dwelling organisms in the areas of and adjacent to the structure during construction.

ADVERSE — LONG TERM

- Alter patterns of nearshore water circulation.
- Alter patterns of coastal erosion and accretion.



GROINS ON BRIGANTINE ISLAND **Figure 2-16**

2.3.3.10.2 SUITABLE AREAS

The entrances to Brigantine, Absecon and Great Egg Harbor Inlets. Figure 2-17 is a photograph of the jetty at the southern end of Brigantine Island.

2.3.3.10.3 CONDITIONS OF ACTIVITY ACCEPTABILITY

- Jetties should be constructed only if necessary to stabilize or to prevent the shoaling of inlet channels.
- The entrance channel should be aligned as closely as possible to the natural channel.

2.3.3.11 MOORING BUOYS

2.3.3.11.1 POTENTIAL ENVIRONMENTAL IMPACTS

The following environmental impacts may be associated with mooring buoys:

FAVORABLE — LONG TERM

- Attract fish and provide substrate for various aquatic organisms.

2.3.3.11.2 SUITABLE AREAS

Suitable areas include all bays and waterways except where they would interfere with navigation or where increased human activity would interfere with rookeries.

2.3.3.11.3 UNSUITABLE AREAS

The intracoastal Waterway, inlet channels, and other navigable waters. See Figure 2-18.

2.3.3.12 MOSQUITO CONTROL

2.3.3.12.1 POTENTIAL ENVIRONMENTAL IMPACTS

The following environmental impacts may be associated with mosquito control:

FAVORABLE — LONG TERM

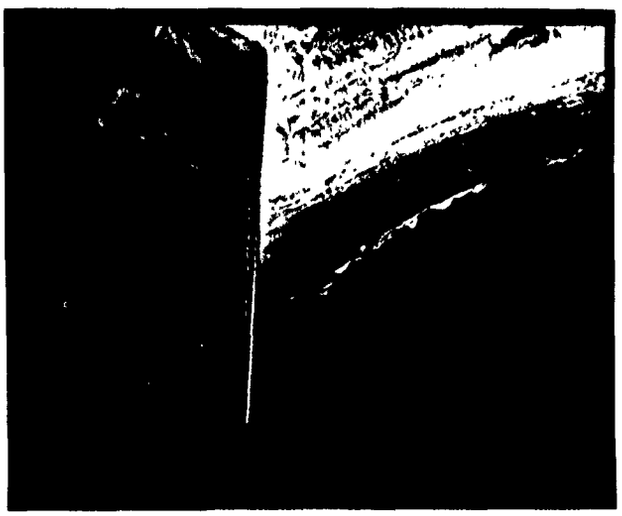
- Enhances tidal flushing of the marsh,
- Enhances the tidal food web,
- Minimizes the need to use pesticides to control mosquitoes, and
- Provides additional habitat for waterbirds.

ADVERSE — SHORT TERM

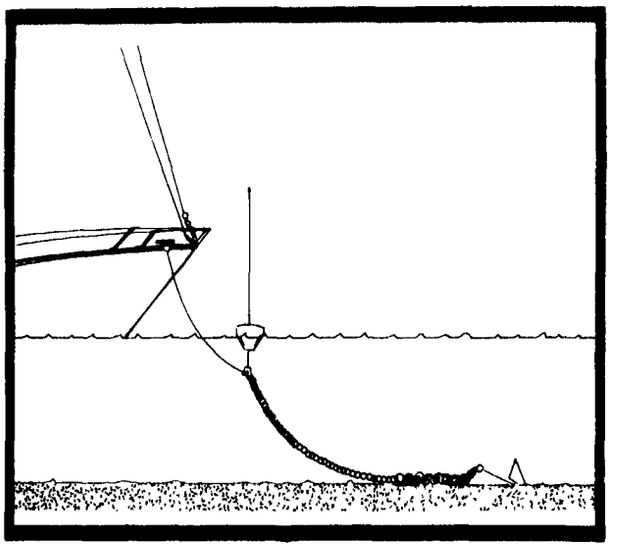
- Increases the turbidity of local waters during ditch and pond construction, and
- Disturbs the marsh surface during disposal of excavated material.

ADVERSE — LONG TERM

- Increases the rate of marsh succession if spoil piles are left on the marsh,



JETTY ON BRIGANTINE ISLAND **Figure 2-17**



MOORING BUOY **Figure 2-18**

- Drains the higher marsh, and
- Alters the marsh unnecessarily if improperly executed.

2.3.3.12.2 SUITABLE AREAS

Open Marsh Water Management techniques would generally be acceptable with conditons in areas with mosquito breeding.

2.3.3.12.3 CONDITIONS OF ACTIVITY ACCEPTABILITY

- Mosquito control efforts should follow the guidelines for Open Marsh Water Management as adopted by the State of New Jersey, Department of Environmental Protection;
- Disruption of the marsh shall be minimized;
- A rotary ditcher shall be used to create tidal ditches, ponds, and pond radials. If a rotary ditcher is not available, use of other appropriate equipment is acceptable if placed on mats;
- Spoil should be spread in a fine layer over the surrounding marsh. It should not be allowed to accumulate in piles on the marsh;
- New ditches should be dug only where necessary to connect mosquito breeding depressions to tidal waters or to ponds; and
- Ponds should be maintained at a depth sufficient to provide habitat for fish during periods of drought. They should remain isolated from the tidal ditching system.

2.3.3.12.4 UNSUITABLE AREAS

Open Marsh Water Management would not be allowed in areas where its need has not been established.

2.3.3.13 OUTFALLS

2.3.3.13.1 POTENTIAL ENVIRONMENTAL IMPACTS

The following environmental impacts may be associated with outfalls:

ADVERSE — LONG TERM

- In the case of sanitary outfalls, increase a waterbody's organic load and bacterial count which decreases water quality. Poor water quality may result in the closing of shellfish beds;
- In the case of effluent from stormwater outfalls, increase a waterbody's concentration of heavy metals and hydrocarbons. Increases in bacterial count may result in the closing of shellfish beds;
- In the case of combined sanitary and stormwater outfalls, combine the impacts mentioned above;
- In the case of industrial waste, have a variety of impacts depending on the constituents of the waste. In most cases, they result in negative impacts to water quality; and
- In the case of effluent from thermal outfalls, raise local water temperatures and alter local biological communities.

2.3.3.13.2 SUITABLE AREAS

Stormwater outfalls are generally acceptable provided their effluent does not impair ambient water quality or adversely affect local aquatic communitites.

2.3.3.13.3 CONDITIONS OF ACTIVITY ACCEPTABILITY

- Evaluation of the outfall structure and its effluent, and
- Compliance with EPA water quality standards.

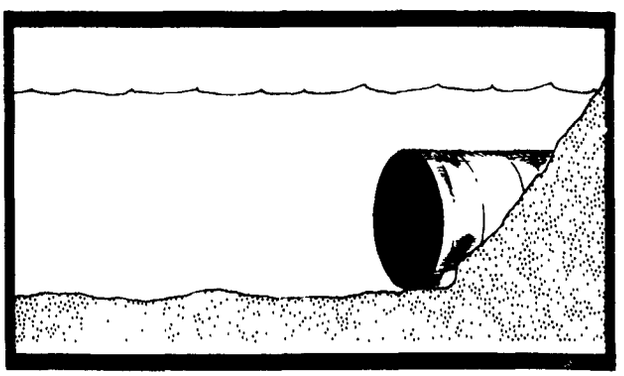
2.3.3.13.4 UNSUITABLE AREAS

Areas of poor tidal flushing are not recommended to accommodate outfalls. See Figure 2-19.

2.3.3.14 PILING—SINGLE AND CLUSTER

2.3.3.14.1 POTENTIAL ENVIRONMENTAL IMPACTS

The following environmental impacts may be associated with pilings:



AN OUTFALL **Figure 2-19**

FAVORABLE — LONG TERM

- Provide substrate for the attachment algae and other organisms.

ADVERSE — SHORT TERM

- Disturb benthos and resuspension bottom sediment

ADVERSE — LONG TERM

- Trap silt and sediment or alter patterns of water circulation if clustered in sufficient numbers,
- Shade marsh and aquatic plants if clustered in sufficient numbers or if associated with structures, and
- Adversely affect wetlands via the secondary impacts of the development of support facilities such as parking lots, recreational areas, and service facilities.

2.3.3.14.2 SUITABLE AREAS

The use of pilings is acceptable generally within the study area. In situations where the foundation of a dock, wharf, or other water dependent structure is required in wetlands, the use of pilings is preferable to the placement of a structure on fill.

2.3.3.14.3 CONDITIONS OF ACTIVITY ACCEPTABILITY

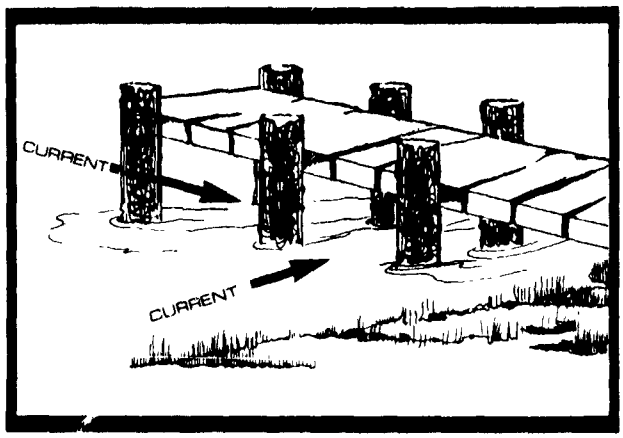
- The size of the supported structure should be limited to that necessary for the proposed use,
- The placement of pilings should not interfere with navigation, and
- Pilings should not be used to provide overwater locations for nonwater dependent structures such as restaurants, parking lots, or hotels.

See Figures 2-20 and 2-21.

2.3.3.15 PIPELINE OR SUBMERGED CABLE

2.3.3.15.1 POTENTIAL ENVIRONMENTAL IMPACTS

The following environmental impacts may be associated with pipelines or submerged cables:



TYPICAL PILE SUPPORTED DOCK Figure 2-20

ADVERSE — SHORT TERM

- Remove organisms and substrate in areas to be dredged or excavated,
- Disrupt wetlands adjacent to the proposed project,
- Increase local sedimentation rates,
- Degrade local water quality, and
- Expose disturbed areas to erosion.

ADVERSE — LONG TERM

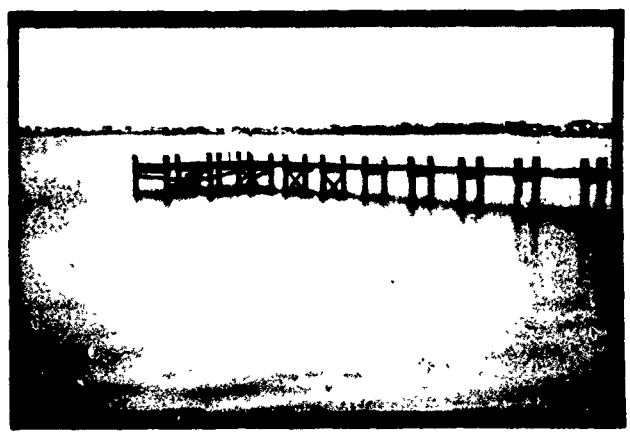
- Leak pipeline contents, and
- In subtidal areas, create anaerobic conditions within the pipeline trench unless backfilled to the preconstruction elevation of the waterbody.

2.3.3.15.2 SUITABLE AREAS

Existing utility and transportation corridors are acceptable locations if the following conditions are met.

2.3.3.15.3 CONDITIONS OF ACTIVITY ACCEPTABILITY

- Subsurface rather than above-surface pipelines are recommended;
- Wherever possible, cables and pipelines should cross water channels on existing bridges;
- Maximum use should be made of existing rights-of-way or previously disturbed utility corridors;
- The use of heavy equipment on wetlands should be avoided whenever possible. Whenever such use is necessary, mats should be placed under equipment to minimize wetland disturbance;
- If excavation or dredging is necessary, trenches should be backfilled to preconstruction elevation;
- Disturbed wetlands should be revegetated;
- Tidal circulation and/or downstream flow during pipe placement should be maintained;



PILINGS SUPPORTING A DOCK Figure 2-21

- To prevent erosion of unstable banks, hay bales should be staked along the outside edge of the proposed work area;
- All excavated material should be removed to an upland site;
- Only clean, inorganic material should be used as fill for the creation of temporary access roads;
- After completion of pipeline installation, fill should be removed to the original grade or slightly below grade if the original elevation were above mean high water. Excess inorganic material from temporary access roads may be used to refill the pipeline trench.

2.3.3.15.4 UNSUITABLE AREAS

Placement of pipelines and submerged cables is not generally acceptable in areas of high value for fish and wildlife spawning, migration, or nesting. See Figure 2-22.

SEWAGE PIPELINE CROSSING MARSH NEAR CLAM THOROFARE **Figure 2-22**

2.3.3.16 PYLON, OVERHEAD CABLE

2.3.3.16.1 POTENTIAL ENVIRONMENTAL IMPACTS

The following environmental impacts may be associated with pylons:

ADVERSE — SHORT TERM

- Disturb bottom sediment, increase turbidity, and alter benthic habitat during construction.
- Disrupt adjacent wetlands by the construction of access routes
- Expose disturbed areas to erosion.

ADVERSE — LONG TERM

- Bury the affected area.
- Alter adjacent areas.

2.3.3.16.2 SUITABLE AREAS

This activity is acceptable generally if the following conditions are met.

2.3.3.16.3 CONDITIONS OF ACTIVITY ACCEPTABILITY

- There should be minimal or no fill material placed on wetlands;
- Use should be made of existing rights-of-way or previously disturbed utility corridors;
- The use of heavy equipment on wetlands should be avoided whenever possible. Whenever such use is necessary, mats should be placed under equipment to minimize wetland disturbance;
- All impacted areas other than those occupied by structures should be backfilled to their preconstruction elevation and revegetated;
- To prevent erosion of unstable banks, hay bales should be stakes along the outside edge of the proposed work area;
- All excavated material should be removed to an upland site;

- Only clean, inorganic material should be used as fill for the creation of temporary access roads; and
- After completion of pylon installation, fill material should be removed to the original grade or slightly below grade if the original elevation were above mean high water. Excess inorganic material from temporary access roads may be used to refill excavated areas. See Figure 2-23.

2.3.3.17 RIPRAP

2.3.3.17.1 POTENTIAL ENVIRONMENTAL IMPACTS

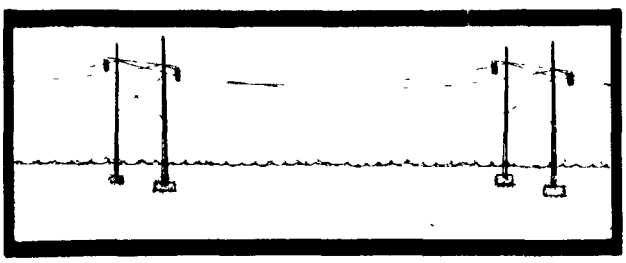
The following environmental impacts may be associated with the use of riprap.

FAVORABLE — LONG TERM

- Provides hard substrate for the attachment of intertidal organisms.

ADVERSE — LONG TERM

- Alters existing natural habitat,
- Creates a barrier between open water and upland areas for animals such as the diamond backed terrapin, and
- Interrupts natural processes of erosion and accretion.



PYLONS, OVERHEAD CABLE **Figure 2-23**

2.3.3.17.2 CONDITIONS OF ACTIVITY ACCEPTABILITY

- Whenever possible, vegetative stabilization is the preferred method of shore stabilization or protection;
- When shore stabilization by planting vegetation is not sufficient, both vegetative stabilization and rip rap should be used; and
- Rip rap should be clean, inorganic material of an appropriate size for the location.

2.3.3.17.3 UNSUITABLE AREAS

Riprap is not generally recommended for areas where the bank to be stabilized has a slope greater than 45 degrees. See Figures 2-24 and 2-25.

2.4 MOORING FACILITIES

2.4.1 PURPOSE

The Corps frequently receives permit applications for the construction, expansion, or maintenance of mooring facilities. This section provides additional information regarding these types of activities. Specifically, it presents:

- A review of existing berthage[1] and storage facilities,
- A projection of likely trends in mooring facility development,
- A discussion of governmental review of proposed waterfront facilities,
- An assessment of the impacts of support facilities and boat operation on the estuarine environment, and
- Recommendations for the siting of mooring facilities.

[1]Berthage - The place where a boat lies when at anchor or at a wharf

RIPRAP **Figure 2-24**

2.4.2 EXISTING MOORING FACILITIES

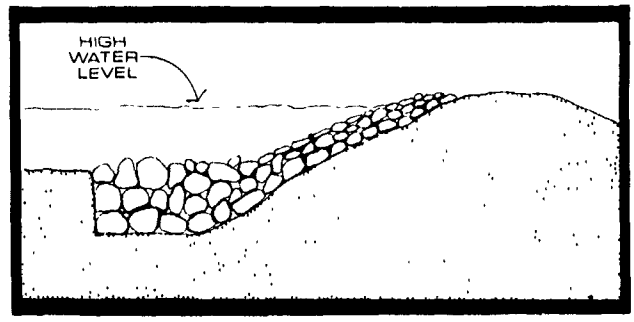
Mooring facility development within the study area is especially dense along the inland edge of the barrier islands. Here, protected sites and navigable waters provide an ideal location for storing, securing, servicing, and operating small craft. Facilities are predominantly individual docks and piers (both fixed and floating), although some common facilities and mid-sized marinas are also present. Few free standing moorings of the anchor and buoy type are found within the study area. On Brigantine Island, the majority of mooring facilities is located along Broad Creek, Golden Hammock Thorofare, Bonita Tideway, Wading Thorofare, Obes Thorofare, and Steelman Bay. On Absecon Island, the focus of moorage development is at the southwestern tip of the island in Longport, and along the southeastern bank of Beach Thorofare in Margate (Figure 2-26). Considerable berthage also exists adjacent to Inside Thorofare and the Intracoastal Waterway in Ventnor and Atlantic City (Figure 2-27). Marina establishments are relatively few and most are scattered within the southern half of the study area. The largest boating complex is the Frank S. Farley State Marina adjacent to Absecon Inlet in Atlantic City (Figure 2-28). Private waterfront facilities are an integral element of waterfront housing neighborhoods and typically line the shore of middle and upper income residential neighborhoods (Figure 2-29).

2.4.3 FUTURE MOORING FACILITY DEVELOPMENT

Future mooring facility development will be influenced by the interplay of several major factors, particularly the nature of market demand. Market demand may be represented by two groups, each accommodating different marine recreation needs:

- Those who rent apartment and hotel space or whose vessel provides lodging, and
- Those who occupy single family waterfront residences.

Whereas the former group provides a market for marina facilities, the latter tends to prefer private berthage. Demographic data for



RIPRAP USE **Figure 2-25**

BEACH THOROFARE, MARGATE **Figure 2-26**

Atlantic City and adjacent island communities reveals that the area's population is disproportionately composed of renters and seasonal residents [1] Within the Atlantic City area, marine facility demand as derived from demographic indices indicates that trends in moorage development will be dominated by marina development.

Several other factors reinforce the contention that marinas will constitute the major component of future moorage development. Most important among these are the high value and limited availability of developable sites. This situation is evident in Absecon Island where existing residential, retail, commercial, resort, and public uses leave little room for new development. Clearly, the intense use of barrier island land means that new development, and water-related projects in particular, will likely be forced to make the most efficient use of space. In terms of mooring facility development, this implies construction of marina complexes featuring a cluster arrangement of boating facilities, stack storage yards, and the like.

Perhaps the most important factor involved in project siting is access to the boating facility, to navigable waters, and to the destination of recreational boaters. Considerations of access are different for individual docks and piers than they are for marina complexes. Whereas access to private docks is characterized by relatively short backyard walkways, vehicular travel is usually necessary in the case of marinas. Considerations of land and water access suggest that the best location for marina development is that

INSIDE THOROFARE, ATLANTIC CITY **Figure 2-27**

[1] Atlantic City's seasonal population was fully 150 percent larger than its permanent population in 1970 The study area's seasonal population was 88 percent the size of its permanent population Of the total number of year-round dwelling units in Atlantic City, only 31 percent were owner-occupied and 69 percent were renter-occupied in 1970 Conversely, the percentage of owned versus rented units in Atlantic County was 62 percent and 39 percent, respectively

FARLEY STATE MARINA, ATLANTIC CITY **Figure 2-28**

area where routes of land and water transportation intersect (Figure 2-30). Major traffic arteries of the unlimited access type are preferred. Bridge clearance must also be sufficient for uninterrupted boat passage.To meet navigational needs, the minimum depth of waterways is estimated at three feet mean low tide for small craft, with deeper waters required for larger boats.

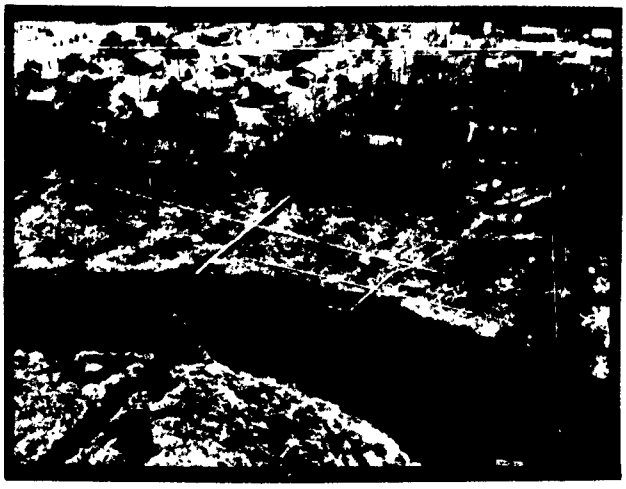
Site characteristics and spatial arrangements considered favorable to the development of mooring facilities are found in certain parts of the study area, notably where population centers are located near waters which are naturally deep enough to allow boating without dredging In order of decreasing market potential, these areas are:

- The inland edge of the barrier islands along the major waterways,
- The interface between transportation corridors and deep water,
- Certain parts of Absecon and Great Egg Harbor Inlets, and
- The lower reaches of Absecon Creek.

Where vacant, developable lands located at the intersection of navigable waters and transportation routes are not available, developers may choose to extend access roads, water supply lines, and other utilities and services to more distant sites.

2.4.4 GOVERNMENT REVIEW

Governmental review of proposed waterfront facilities has an important influence on the distribution patterns of mooring facility development within the study area. This influence derives from the policies and programs of government agencies at the Federal, State and local levels (see also Vol. II, Chapter 5, Institutional Frame-



MOORING FACILITY DEVELOPMENT ALONG THE BACK BAY — MAINLAND EDGE **Figure 2-29**

MARINA LOCATED AT INTERSECTION OF LAND AND TRANSPORTATON ROUTES **Figure 2-30**

work). Just as market forces determine the economic feasibility of a particular project site, governmental review determines its environmental acceptability. The assessment of environmental impacts in terms of the public interest may have an important effect on the final location and design of a proposed facility.

The most important facet of Federal review involves the permit program administered by the Corps. Under the Corps' permit application review program, the acceptability of project proposals is based on both design criteria and case-by-case review. For certain aspects of a proposed project, specific construction and design standards may apply. Other aspects of project design are less adaptable to explicit permit criteria and must be reviewed on an individual basis.

The following factors are considered in processing applications involving dredging:

- Why and to what extent would basin and/or channel improvement be required?
- How much material would be dredged?
- Where would the dredged material be placed?
- At what interval would maintenance dredging occur?
- Where would material dredged for maintenance purposes be placed?
- What are the effects of dredging on currents, water quality, tidal circulation and sedimentation patterns?
- How could these impacts be minimized?

In addition to the acceptable and conditional types of moorage-related activities are those activities which are either severely restricted or generally prohibited. Aspects of mooring facility development which are generally prohibited by the Corps include:

- The disposal of dredged material on wetlands;
- The unavoidable destruction of wetlands without offering compensatory measures such as marsh creation of equivalent productivity; and
- The construction of dead-end canals or lagoons.

In the above cases, permit applications may be denied. In cases significantly affecting the quality of the human environment, the preparation of an Environmental Impact Statement (EIS) would be required.

At the State level, permission to develop or otherwise improve riparian lands must be secured through the New Jersey Department of Environmental Protection, Bureau of Tidelands. This Bureau serves the Tidelands Resource Council which makes decisions on the sale and leasing of State owned tidelands. Mooring facility projects must also be reviewed and approved by the Bureau of Coastal Project Review. The Bureau provides clearance for CAFRA, wetlands, and waterfront development permit applications in conformance with applicable legislation and coastal resource and development policies. The work of these offices is coordinated by the Division of Coastal Resources within the New Jersey Department of Environmental Protection The

functions of these and other State agencies are more fully explored in Vol II, Chapter 5, Institutional Framework.

New Jersey's approved Coastal Management Program - the Bay and Ocean Shore Segment (BOSS) (August, 1978) defines boating facilities and marinas as resort-recreation uses. Under the Coastal Land Use Policy established by this program, resort-recreation uses have "priority over all other uses, with highest priority reserved for those uses that serve a greater rather than a lesser number of people." This statement indicates the preferential status accorded such facilities, and moreover, the desirability of marinas relative to individual docks and piers. Although considered a priority use of coastal resources, the acceptability of marinas is nonetheless subject to several conditions including:

- "The demonstrated regional demand for recreational boating facilities cannot be met by the upgrading or expansion of existing marinas,
- The proposed marina includes the development of an appropriate mix of dry storage areas, public launching facilities, and berthing spaces, depending upon the site conditions, and
- The proposed marina provides adequate pump out stations for wastewater disposal from boats in a manner consistent with Federal and State water quality laws and regulations."

The general conditions presented above are supplemented by more specific criteria under the wetlands permit program. Wetland regulations require mooring related activities to obtain a Wetland permit, the issuance of which depends upon whether the project:

- "Requires water access or is water oriented as a central purpose of the basic function of the activity,
- Has no prudent or feasible alternative on a non-wetlands site,
- Will result in minimum feasible alteration or impairment of natural tidal circulation, and
- Will result in minimum feasible alteration or impairment of the natural contour or the natural vegetation of the wetlands."

Source. (Section 5.0, Procedural Rules and Regulations to Implement the Wetlands Order)

Several sets of policies and regulations at the municipal level also pertain to the development of mooring facilities within the study area.

2.4.5 MOORING FACILITY IMPACT ANALYSIS AND MITIGATION MEASURES

2.4.5.1 INDIVIDUAL MOORING FACILITIES

An individual boating facility may be composed of docks and piers for securing small craft, ramps for launching boats into the water, walkways that provide access to these facilities, floating structures, and of pilings that support these structures. The composition, placement and design of individual boating facilities varies with the characteristics of the site and needs of the owner.

The effect of these facilities on the estuarine environment is generally considered to be minor. The impact of certain project components, however, is more adverse than others. Perhaps the most adverse impacts result from the placement of bulkheads that infringe on wetlands or eliminate the transition zone between wetland and upland areas, disturb substrate, and resuspend bottom sediments. The placement of docks, piers, and pilings may also alter the circulation and sedimentation patterns of tidal waters. Although these effects may be minimal in the case of individual facilities, their impacts become more significant as the number and density of structures along a particular waterway increase. Ways of maintaining existing patterns of water movement and sediment transport include limiting the number of pilings, spacing pilings in a manner which least interferes with water flow, and using floating rather than permanent structures. The detrimental effects of walkways can be minimized by constructing elevated structures which allow light to reach wetland areas below them.

2.4.5.2 BUOY AND ANCHOR MOORINGS

Buoy and anchor mooring facilities usually consist of a main dock and accompanying support services to boats moored by anchor.

The siting considerations for buoy and anchorage areas are similar to those for marinas, but as less shoreline is affected, their impacts on the coastal ecosystem are not as severe. Interference with established patterns of navigation would be a major adverse impact if the facilities were not property sited.

2.4.5.3 MARINAS

Of the adverse environmental impacts of marina development, marsh or shallow water habitat loss, increased surface runoff, and the need for filling, dredging, maintenance dredging, and dredged material disposal are typical. Such potential adverse environmental impacts may be mitigated by incorporating proper siting and design measures In some cases, the expansion of existing marina facilities may be more desirable than the construction of new facilities in a previously undisturbed area. In either case, nonwater dependent facilities such as parking lots and storage areas should be located on upland areas.

For sites removed from existing roadways, vehicular access and utility services may be extended. In many instances, however, this means that rights-of-way must transect marsh which causes adverse impacts to wildlife habitat, vegetative cover, water quality, and related concerns. For sites with non-navigable waterside conditions, spot dredging to establish and/or maintain sufficient dockside or channel depth may be necessary. Such spot dredging would temporarily increase local turbidity, disrupt benthic communities, and create problems with respect to maintenance dredging and dredged material disposal. In other instances, the installation of bulkheads and associated backfill, breakwaters, or other structures may destroy intertidal or shallow water habitat or alter local wave and current regimes. Generally, it is not the boat-securing structures but related activities that are more disruptive to the estuarine environment.

The degradation of water quality resulting from the location of boating facilities in poorly flushed areas may be one of the more severe impacts associated with marina development. Poorly flushed sites include areas such as dead-end canals and other areas where tidal exchange is minimal. Their lack of oxygen carrying water contributes to anaerobic conditions, reduced biological productivity, and fowl sulphurous odors (Daiber *et al.*, 1974).[1] Lagoon flushing patterns are primarily determined by their physical dimensions, location, and orientation which directly affect the horizontal and vertical circulation of lagoon waters. Daiber *et al.*, (1974), recommend that, "Any lagoon construction being designed should facilitate water circulation throughout the system. Such design must take prevailing wind directions, hydrographic, chemical and biotic characteristics of the locale into account."

An idealized marina site is presented in Figure 2-31.

2.4.6 FACILITY OPERATION AND BOAT USE

In addition to the impacts identified in the construction of boating facilities, other impacts are incurred through marina operation and boat use. With respect to marina activities, the most important areas of environmental concern relate to:

- Boat maintenance yards where regular washing, sanding, painting, and bilge drainage may introduce detergents, oily waste, and other toxic materials into the aquatic environment;
- Refueling stations where gasoline or diesel fuel spills may occur, and
- Sanitation systems where lack of pumpout services and public restrooms may lead to the degradation of water quality and the contamination of shellfish beds.

Impacts related to motorized boating activity include:

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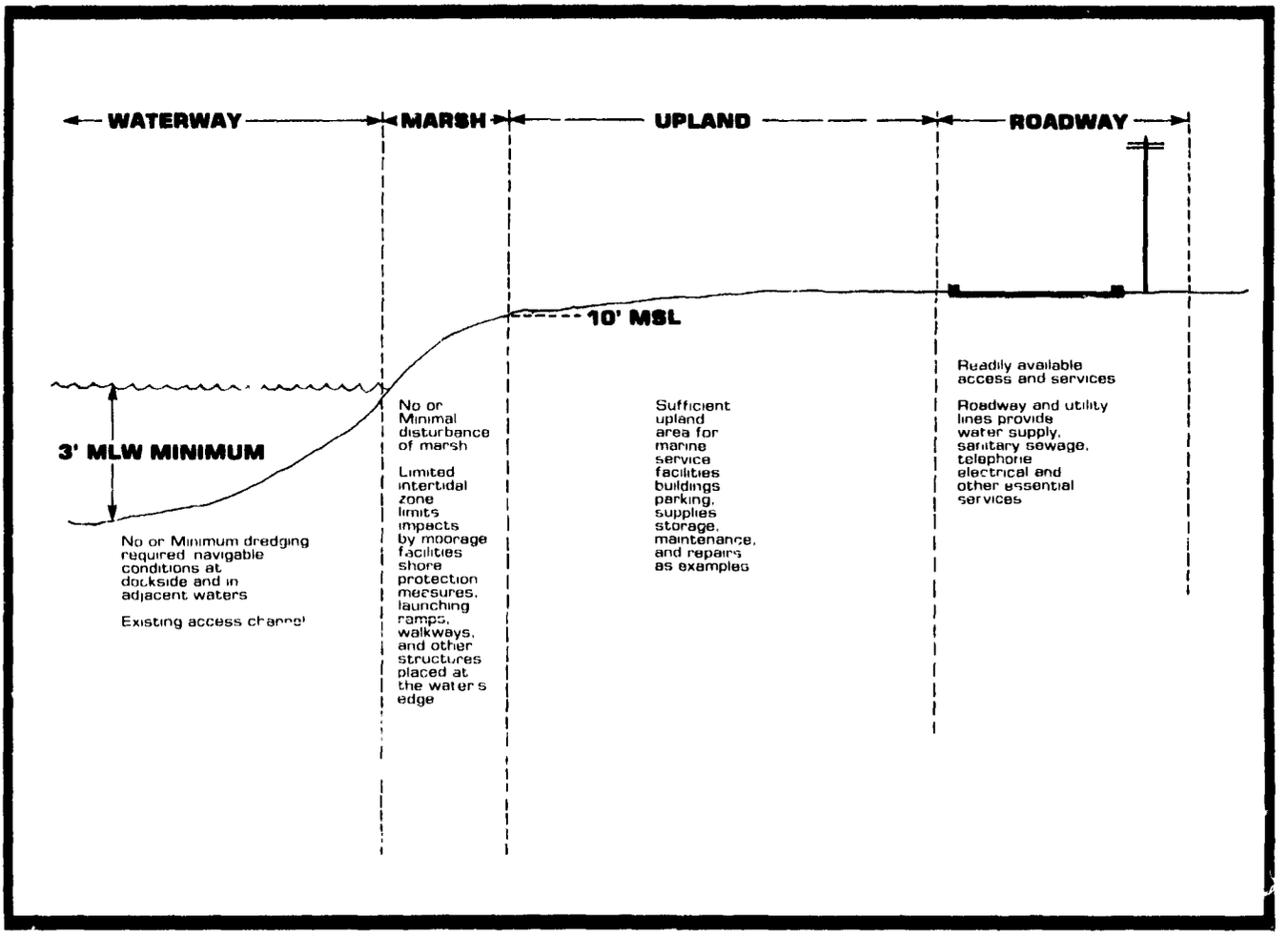
[1]Anaerobic conditions occur when organic matter decomposes in the absence of oxygen. Under these conditions anerobic bacteria take over the decomposition process One of the end products of this process is hydrogen sulfide gas (H_2S) which has a characteristic rotten egg odor

The oxygen carring capacity of water is determined by several factors including temperature, pressure, and pH Gases are exchanged between the bottom and overlying water If the water is not in motion, a state of equilibrium is reached in which water near the bottom is depleted of oxygen due to its removal by benthic organisms As soon as a state of oxygen depletion is achieved, anaerobic bacteria begin to reduce sulphur and produce H_2S without oxygen and the oxygen-respiring inhabitants of the benthos and overlying water suffocate and die This situation can be alleviated by renewal of the oxygen supply within the lower strata of the water column



IDEALIZED MARINA SITE **Figure 2-31**

- Disturbance of bottom sediment and benthic communities, and the destruction of aquatic vegetation in areas of heavy boat use;
- The degrading effect of exhaust pollutants on water quality and aquatic systems;
- The disruption of wildlife nesting and resting areas by motor boat noise and human intrusion; and
- The hazards associated with raw sewage discharge.

The severity of virtually all impacts associated with motor boating and marina operations may be minimized through standard procedures of pollution abatement and marine code compliance. Mitigative measures applicable to boating activity include emission control devices for marine engines, seasonal restrictions on human intrusion into wildlife areas, and Coast Guard regulations requiring vessels with permanent heads to install holding tanks and marine sanitation devices (33 USC 1322).

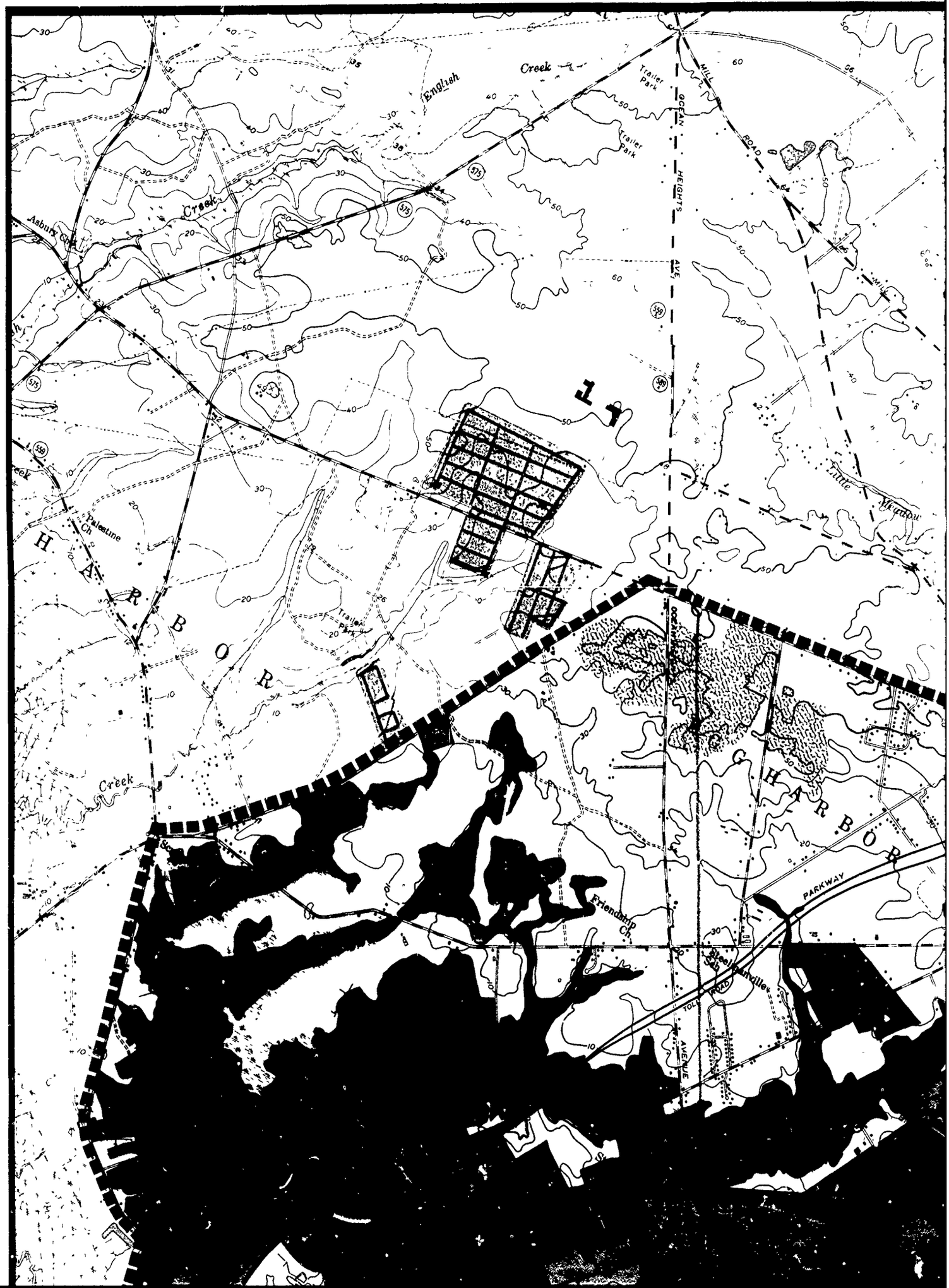
2.4.7 ACCEPTABILITY OF MOORING FACILITY PROPOSALS

Proposed mooring facilities would be acceptable generally with conditions provided that:

- There would be insignificant alteration or impedence of channel circulation and tidal flushing,
- There is minimal or no disruption of marsh, shallow water habitat, or shellfish beds,
- Direct vehicular access and utility service from a nearby roadway intersect with navigable waters of sufficient dockside and channel depth,
- The proposed depth of dredging is not greater than the depth of adjacent waters,
- The need for initial dredging is non-existent, or if minimal dredging is necessary, upland disposal sites are available, and
- Disposal sites for maintenance dredging are available.

Mooring facilities are likely to be discouraged or determined generally unacceptable in cases where:

- The absence of sufficient uplands at the site necessitates alteration or filling of wetland for the purpose of constructing access roads, parking lots or other service facilities;
- The waterway fronting the proposed site is not navigable at mean low tide;
- The construction of dead-end canals is necessary for completion of the mooring facility;
- Construction of the mooring facility necessitates structural interference with the navigability of a waterway; and
- Construction or use of the facility would seriously impact shellfish beds.


English
Creek
Trailer Park
Trailer Park
OCEAN HEIGHTS AVE.
MILL ROAD
Asbury Ch
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Palestine Ch
H A R B O R
Trailer Park
Creek
Friendship Ch
PARKWAY
AVENUE

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Mill
Branch
Cardiff
LINES
Nordheim Flying K Airport
Pine View Ch
Drive in Theater
Run
GARDEN STATE PARKWAY
TOLL ROAD
Patcong
Lake
Branch
Little Meadow
Little Meadow
Run
Bargaintown
Standpipe
FIRE
CITY
BDY
MILL ROAD
Maple
Run
Zion Ch
Maple
Birch Grove Park
Northfield
Bargaintown Pond
Northfield
PARKWAY
Trailer Park
LINES

LANTIC CITY
RESERVOIR
Trailer Park
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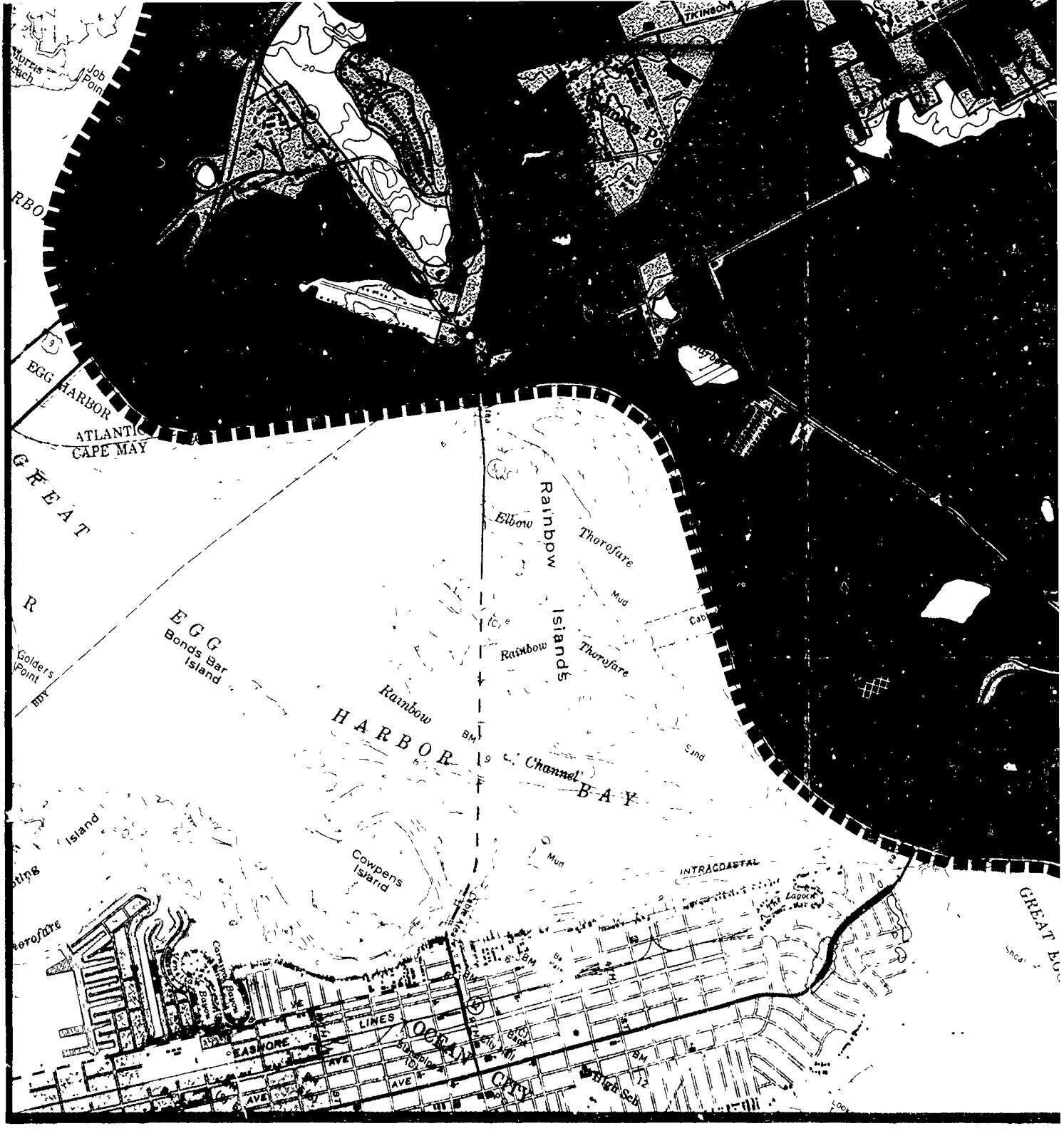
CITY
Tollgate
Disposal
ATLANTIC CITY
EXPRESSWAY


Oceanville
Lily Lake
Doughty
Abscom Highway
Grassy Rm
(C)


BRIGANTINE
WILDLIFE
NATIONAL
REFUGE
Hammock
Cove
GREAT BAY
OCEAN CO
ATLANTIC CO
Main Marsh Thorofare
Perch
Cove
Shad
Island
Big Shad
LITTLE
BAY
LITTLE BAY
Black Point
Grassy
INTRACOASTAL
WATERWAY
Egg
Island
Mud Thorofare
Little Mud Thorofare
Crooked Thorofare
Betsey Channel
Elder
Island
Sand and Mud
Light
Ruins



0 1 2 MILES

0 1000 2000 3000 4000 5000 6000 7000 FEET

0 1 2 KILOMETERS

LOW DENSITY DEVELOPMENT

HIGH DENSITY DEVELOPMENT

DREDGED MATERIAL DISPOSAL SITE

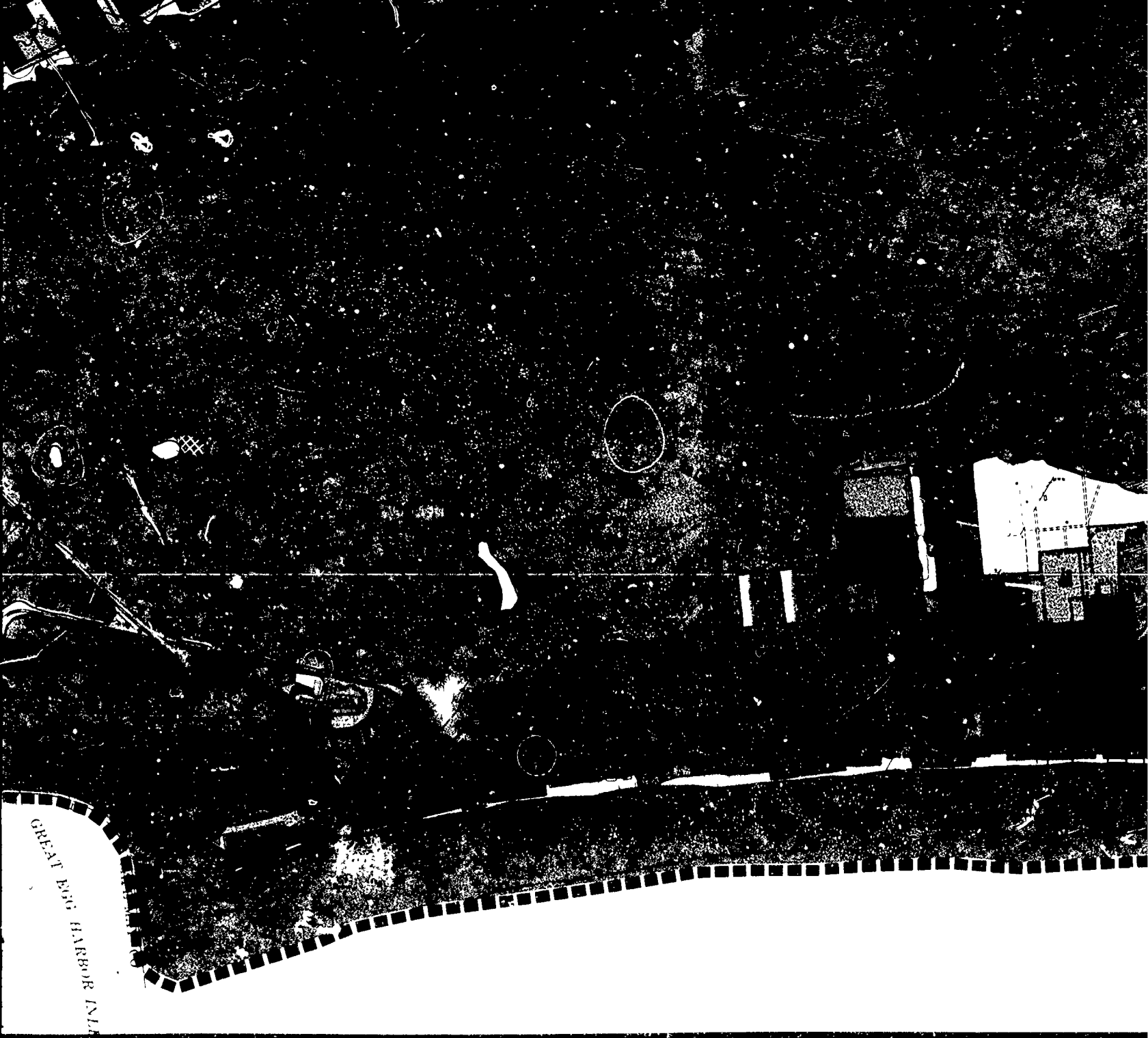
CONTOUR INTERVAL 10 FEET

DATUM IS MEAN SEA LEVEL

DEPTH CURVES AND SOUNDINGS IN FEET DATUM IS MEAN LOW WATER

SHORELINE SHOWN REPRESENTS THE APPROXIMATE LINE OF MEAN HIGH WATER

THE MEAN RANGE OF TIDE IS 4 FEET



AREAS OF IMPORTANCE

AREAS OF CONCERN

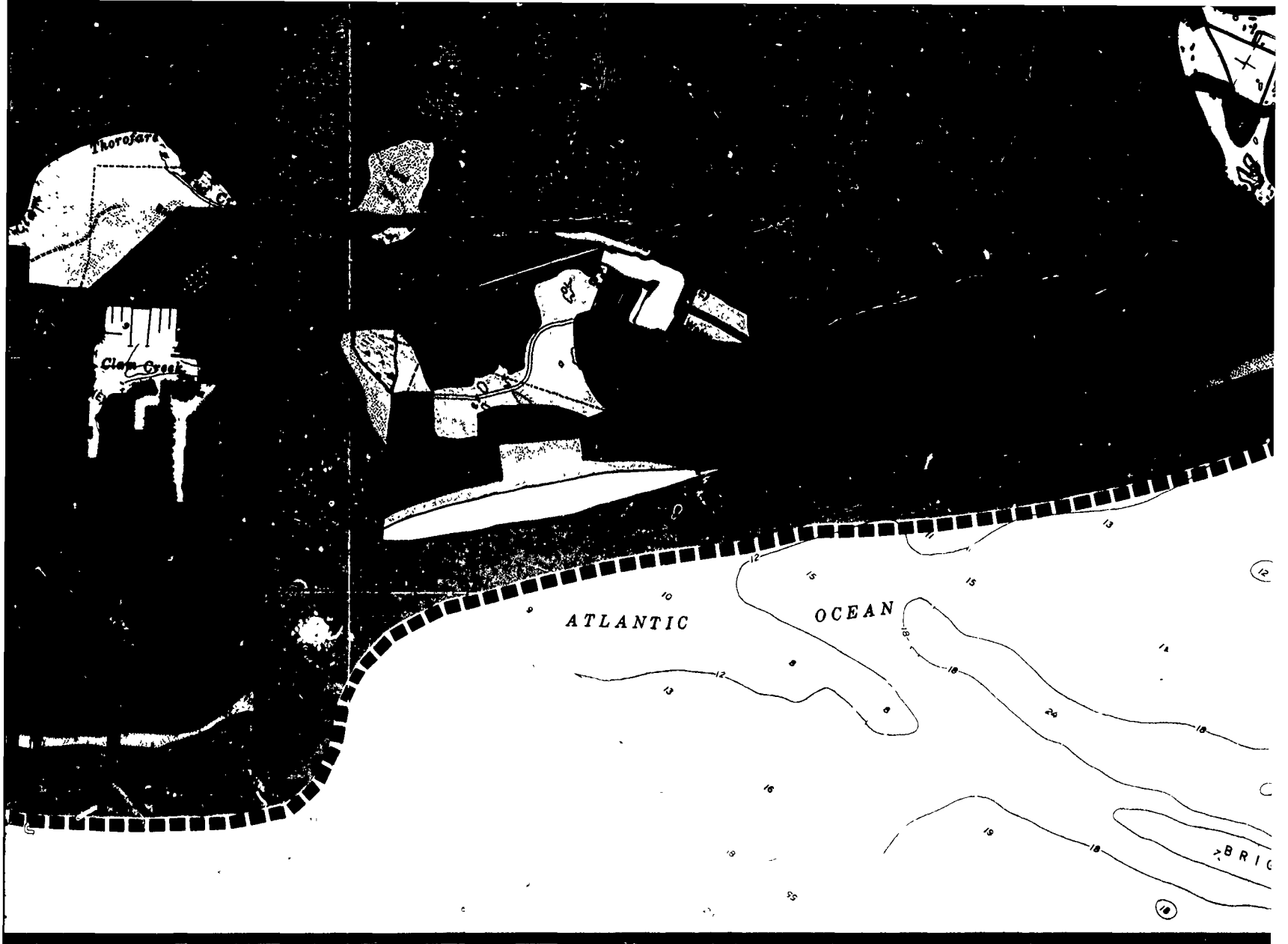
STUDY AREA BOUNDARY

DREDGED MATERIAL DISPOS

The dredged material disposal sites identified on the Study Area B is
continue to be used by the Corps of Engineers for dredged
maintenance of the New Jersey Intracoastal Waterway (NJIWW
These sites are furnished to the Corps by the State of New Jer
cooperation requirements of the NJIWW project. The designation
following coordination with Federal and State agencies and
with Section 404 of the Clean Water Act.

DISPOSAL SITES

Study Area Base Map have been and may
as dredged material disposal sites for
way (NJIWW) Federal Navigation Project
e of New Jersey as required by the local
he decision to utilize the sites was made
cies and the general public in accordance



ATLANTIC CITY AREA

REA WETLANDS REVIEW

STUDY AREA BASE MAP